

**PROJECT MANUAL
FOR
36-INCH RAW WATER MAIN IMPROVEMENTS-
REPLACEMENT OF WESTERN BRANCH ELIZABETH RIVER CROSSING (LINE 2)**

**BID OPENING
APRIL 29, 2015 AT 3:00 P.M**



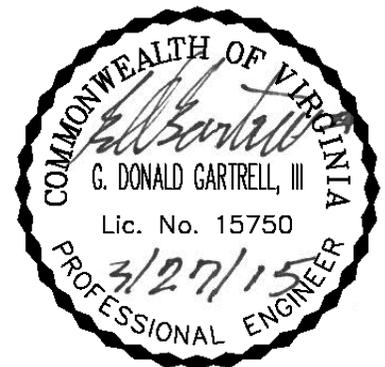
**City of
Norfolk**
Department of Utilities

February 2015

***** PLEASE NOTE *****

These BID DOCUMENTS refer to the Hampton Roads Planning District Commission's Regional Standards, Fifth Edition, December 2010, as amended, which may be obtained from:

HAMPTON ROADS PLANNING DISTRICT COMMISSION
723 WOODLAKE DRIVE
CHESAPEAKE, VA 23320
PHONE (757) 420-8300



Prepared by:

Michael Baker
INTERNATIONAL

Michael Baker Jr., Inc. a
a Michael Baker International company
272 Bendix Road, Suite 400
Virginia Beach, VA 23452

REGIONAL CONSTRUCTION STANDARDS

Fifth Edition

TABLE OF CONTENTS

DIVISION 1 - GENERAL PROVISIONS

Section 101 - Definitions of Terms

Pages

I	General Definitions	101-1 to 101-4
---	---------------------	----------------

Section 102 - Bidding Requirements and Conditions

I	Invitation for Bids	102-1 to 102-3
II	Instructions to Bidders	102-5 to 102-13
III	Bid Form	102-15 to 102-25
IV	Bid Bond 102-2	7
V	Questionnaire	102-29 to 102-37
VI	Certification Regarding Debarment	102-39

Section 103 - Award and Execution of Agreement

I	Award and Execution of Agreement	103-1 to 103-3
II	Notice of Award	103-4 to 103-5
III	Agreement	103-6 to 103-11
IV	Performance Bond	103-12 to 103-13
V	Payment Bond	103-14 to 103-15
VI	Irrevocable Letter of Credit 103-16	to 103-18
VII	Escrow Agreement 103-1	9 to 103-22
VIII	Notice to Proceed	103-23

Section 104 - Scope of Work

I	Intent of Agreement	104-1
II	Amending and Supplementing Contract Documents	104-1
III	Explorations and Reports	104-1
IV	Underground Facilities	104-1 to 104-2
V	Subsurface Conditions	104-2 to 104-3
VI	Site Security	104-3
VII	Documentation of Site Conditions	104-3
VIII	Clean-up, Disposal and Restoration	104-3 to 104-4

Section 105 - Control of Work

I	Reuse of Contract Documents	105-1
II	Copies of Contract Documents	105-1
III	Contract Documents 105-1	
IV	Shop Drawings and Submittals	105-1 to 105-4

V	Record Drawings	105-4	to 105-6
VI	Access to Project	105-6	
VII	Surveys and Reference Points	105-6	
VIII	Working Hours	105-6	to 105-7
IX	Project Coordination	105-7	to 105-9
X	Supervision	105-9	
XI	Uncovering Work	105-1	0
XII	Removal of Unacceptable Work	105-1	0
XIII	Substantial Completion	105-1	0 to 105-11
XIV	Use of Completed Portions	105-1	1
XV	Final Inspection	105-1	1
XVI	Claims	105-1	1 to 105-13
XVII	Engineer's Status	105-1	3 to 105-14
XVIII	Notice to Comply Order	105-1	5
XIX	Stop Work Order	105-1	7

Section 106 - Control of Material

I	Tests and Inspections	106-1	
II	Labor, Materials and Equipment	106-1	to 106-2
III	Work by Owner	106-2	

Section 107 - Legal Relations and Responsibility to the Public

I	Permits and Regulations		107-1
II	Land, Easements, and Rights-of-Way		107-1 to 107-2
III	Protection of Work, Property & Persons		107-2 to 107-4
IV	Environmental Stipulations		107-5 to 107-8
V	Temporary Facilities		107-8
VI	Emergencies		107-8 to 107-9
VII	Warranty and Guarantee		107-9
VIII	Opening Sections of Projects to Traffic		107-9 to 107-10
IX	No Waiver of Legal Rights		107-10

Section 108 - Prosecution and Progress of Work

I	Patent Fees and Royalties	108-1	
II	Taxes	108-1	
III	Notice to Proceed	108-1	
IV	Pre-Construction Conference	108-1	
V	Construction Progress Schedule	108-1	to 108-2
VI	Subcontracts	108-2	to 108-3
VII	Commencement and Prosecution of Work		108-3 to 108-4
VIII	Suspension of Work	108-4	
IX	Termination of Agreement	108-4	to 108-7
X	Liquidated Damages	108-7	to 108-8
XI	Separate Contracts by Owner	108-9	
XII	Indemnification	108-9	

Section 109 - Measurement and Payment

I	Measurement and Payment Procedures	109-1	to 109-8
II	Change Orders and Field Orders	109-8	to 109-9
III	Change Order Form	109-11	
IV	Application for Payment	109-1	3
V	Escrow Agreement	109-1	5 to 109-17
VI	Affidavit of Payment of Claims	109-1	9
VII	Certificate of Substantial Completion	109-2	1
VIII	Statement of Surety Company	109-2	3
IX	Contractor's Release	109-2	5
X	Manhole/Structure Protective Coating Post Installation Certification		109-27 to 109-28
XI	Standard Bid Items and Units		XXXXXXXXXX

Section 110 – Special Provisions

I	Construction Drawings:	110-1	
II	Hampton Roads Planning District Commission Regional Construction Standards:		110-1
II	Insurance Coverage – Off Duty Police Officers		110-1
IV	Supplemental Specifications	110-1	
	• 01330 – Corrosion Control Steel Pipe		
	• 01331 – Corrosion Control Ductile Iron Pipe		
	• 01710 – Project Cleanup		
	• 02260 – Excavation Support Protection Systems		
	• 02315 – Excavating, Backfilling, and Compacting		
	• 02370 – Erosion and Sediment Control		
	• 02510 – DIP WM		
	• 02511 – Steel Pipe		
	• 02514 – Pressure and Leakage Tests		
	• 03300 – Cast-in-Place Concrete		
	• 09930 – Welded Steel Pipe Coatings		

Appendices – Index

APPENDIX A:	Substance Abuse and Drug-Free Workplace Ordinance
APPENDIX B:	Procurement Information Form
APPENDIX C:	Norfolk Modifications to HRPDC Regional Standards, 5 th Edition
APPENDIX D:	Pay Item Descriptions
APPENDIX E:	SWPPP for Contractor Use
APPENDIX F:	Project Sign Detail
APPENDIX G:	“NOT USED”
APPENDIX H:	Soil Borings
APPENDIX I:	Test Hole Results (Pipe)
APPENDIX J:	Contractor’s Use of Temporary Facilities and Staging Areas
APPENDIX K:	“NOT USED”

- APPENDIX L: Host City Approvals
- City of Portsmouth, Portsmouth Wetlands Review Exclusion Letter
 - City of Portsmouth, Site Plan Approval
 - City of Chesapeake, Site Plan Approval

- APPENDIX M: Regulatory Agency Approvals
- Virginia Marine Resources Commission
 - U.S. Army Corps of Engineers

DIVISION 2 - PRODUCTS AND MATERIALS (BY REFERENCE)

Section

200A	Division Table of Contents	200A-1 to 200A-2
200	Products and Materials	200-1 to 200-134

DIVISION 3 - ROADWAY CONSTRUCTION (BY REFERENCE)

Section

300	Division Table of Contents	300-1 to 300-4
301	Clearing and Grubbing	301-1 to 301-5
302	Drainage Structures	302-1 to 302-17
303	Earthwork	303-1 to 303-18
305	Subgrade and Shoulders	305-1 to 305-5
309	Aggregate Base Course	309-1 to 309-3
310	Tack and Prime Coat	310-1 to 310-4
313	Asphalt Surface Treatment	313-1 to 313-5
315	Asphalt Concrete Pavement (NON SUPERPAVE)	315-1 to 315-14
315A	Asphalt Concrete Pavement (SUPERPAVE)	315A-1 to 315A-14
317	Pavement Patching	317-1 to 317-3

DIVISION 4 - MISCELLANEOUS (BY REFERENCE)

Section

400	Division Table of Contents	400-1
406	Reinforcing Steel	406-1 to 406-4
414	Riprap	414-1 to 414-6

DIVISION 5 - INCIDENTAL CONSTRUCTION (BY REFERENCE)

Section

500	Division Table of Contents	500-1 to 500-3
501	Underdrains	501-1 to 501-2
502	Concrete Items	502-1 to 502-14
505	Guardrail and Steel Median Barriers	505-1 to 505-4
507	Fences 507-1	to 507-3
510	Relocating or Modifying Existing Miscellaneous Items	510-1 to 510-3
511	Allaying Dust	511-1 to 511-2
512	Maintaining Traffic	512-1 to 512-18
513	Mobilization	513-1 to 513-1
515	Milling Pavement	515-1 to 515-2
521	Pavers 521-1	to 521-13
530	Abandonment of Existing Pipelines and Structures	530-1 to 530-6

DIVISION 6 – LANDSCAPING (BY REFERENCE)

Section

600	Division Table of Contents	600-1 to 600-2
602	Topsoil	602-1 to 602-2
603	Seeding	603-1 to 603-3
604	Sodding	604-1 to 604-2
605	Planting	605-1 to 605-5
608	Mowing	608-1 to 608-2

DIVISION 7 - TRAFFIC CONTROL DEVICES (BY REFERENCE)

Section

700A	Division Table of Contents	700A-1
700	Traffic Control Devices	700-1 to 700-15
704	Pavement Markings and Markers	704-1 to 704-7

DIVISION 8 - WATER AND WASTEWATER UTILITIES (BY REFERENCE)

Section

800	Division Table of Contents	800-1 to 6
801	Water Distribution Systems	801-1 to 801-19
802	Sanitary Gravity Sewer Systems	802-1 to 802-18
803	Sanitary Force Main Systems	803-1 to 803-12
804	Boring and Jacking	804-1 to 804-4
805	Separation of Water Mains and Sewers	805-1 to 805-2
806	Horizontal Directional Drilling	806-1 to 806-10

Sanitary Sewer Rehabilitation (Sections 810-822)

810	Sewer Line Cleaning	810-1 to 810-6
-----	---------------------	----------------

811	Television Inspection	811-1 to 811-5
812	Bypass Pumping	812-1 to 812-4
813	Pipe Rehabilitation by Cured-in-Place Method	813-1 to 813-11
814	Pipe Rehabilitation by Fold-and-Form Method	814-1 to 814-10
815	Pipe Bursting	815-1 to 815-7
816	Sewer Pipe Joint Testing	816-1 to 816-3
817	Chemical Grouting	817-1 to 817-4
818	Point Repair by Excavation	818-1 to 818-4
819	Insitu Structural Point Repair	819-1 to 819-4
820	Insitu Point Repair by Sectional Lining	820-1 to 820-3
821	Sanitary Sewer Service Reconnections	821-1 to 821-6
822	Manhole Rehabilitation	822-1 to 822

STANDARD DETAILS

Standard Details Table of Contents

SD-1 to SD-2

SECTION 101

DEFINITIONS OF TERMS

I. GENERAL DEFINITIONS

Wherever used in the Contract Documents, the following terms shall have the meanings indicated and shall be applicable to both the singular and plural thereof:

- 1.1 *Addenda* - Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the Bid Documents or the Contract Documents.
- 1.2 *Agreement* - The written agreement between the Owner and the Contractor covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.
- 1.3 *Application for Payment* - The form provided in the Contract Documents which is to be used by the Contractor in requesting progress and final payments and which is to include such supporting documentation as is required by the Contract Documents.
- 1.4 *Bid* - The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
- 1.5 *Bid Documents* - Documentation issued prior to the bid date, including documentation accompanying the Bid (Drawings, Project Specifications, HRPDC *Regional Construction Standards*, Addenda, and Special Provisions) and any post-Bid documentation submitted prior to the Notice of Award.
- 1.6 *Bidder* - Any person, firm or corporation submitting a Bid for the Work.
- 1.7 *Bonds* - Performance and Payment Bonds furnished by the Contractor and the Contractor's surety in accordance with the Contract Documents.
- 1.8 *Bid Security* - Bid Bonds and other instruments of surety, furnished by the Contractor or the Contractor's surety in accordance with the Contract Documents.
- 1.9 *Change Order* - A written order to the Contractor authorizing an addition, deletion, or revision in the Work within the general scope of the Contract Documents that authorizes an adjustment in the Contract Price and/or Contract Time; issued on or after the Effective Date of the Agreement.
- 1.10 *Completion Date* - The date specified in the Notice to Proceed for final completion of the Work.
- 1.11 *Contract Documents* - The Agreement, including the Bid Documents, Notice of Award, Notice to Proceed, Field Orders, Change Orders, and modifications.
- 1.12 *Contract Price* - The total monies payable to the Contractor under the terms and conditions of the Agreement.

- 1.13 *Contract Time* - The number of calendar days stated in the Agreement for the completion of the Work. Calendar days shall be understood to be consecutive.
- 1.14 *Contractor* - The person, firm or corporation with whom the Owner has executed the Agreement.
- 1.15 *Day* - A calendar day of twenty-four hours measured from midnight to the next midnight. Calendar days shall be understood to be consecutive.
- 1.16 *Defective* - An adjective, which when modifying the word Work, refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to the Owner's acceptance.
- 1.17 *Drawings* - The plans that show the character and scope of the Work to be performed.
- 1.18 *Effective Date of the Agreement* - The date indicated in the introductory paragraph of the Agreement.
- 1.19 *Engineer* - The person, firm or corporation named as such in the Agreement. In the event the Owner should not require the services of the Engineer, then the powers, duties, and responsibilities conferred in the Contract Documents to the Engineer shall be construed to be those of the Owner.
- 1.20 *Field Order* - A verbal or written order effecting a change in the Work not involving an adjustment in the Contract Price or an extension of the Contract Time, issued by the Engineer or Owner to the Contractor during construction.
- 1.21 *Final Completion* - All work, including punch list items noted at the final inspection, is complete to the satisfaction of the Owner.
- 1.22 *Laws and Regulations* - Any and all applicable laws, rules, regulations, ordinances, codes and orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.
- 1.23 *Liens* - Liens, charges, security interests or encumbrances upon real or personal property.
- 1.24 *May* - The term "may" is permissive.
- 1.25 *Notice* - All written notices, demands, instructions, claims, approvals, and disapprovals required to obtain compliance with the Contract Documents. Any written notice by either party to the Agreement shall be sufficiently given if delivered to or at the last known business address of the person, firm or corporation constituting the party to the Agreement, or to his, their, or its authorized agent, representative or officer, or when enclosed in a postage envelope addressed to such last known business address and deposited in a United States mailbox. Notice shall be deemed received within 3 business days of U.S. Mail Service postmark date.
- 1.26 *Notice of Award* - A written notice by the Owner to the apparent Successful Bidder stating that upon compliance by the apparent Successful Bidder with the conditions precedent enumerated therein, within the time specified, the Owner will sign and deliver the Agreement.
- 1.27 *Notice to Proceed* - A written notice given by the Owner to the Contractor (with a copy to the Engineer, if appropriate) fixing the date on which the Contract Time will commence to run and on

- which the Contractor shall start to perform its obligations under the Agreement.
- 1.28 *Owner - The public body or authority, corporation, association, firm or person with whom the Contractor has entered into the Agreement and for whom the Work is to be provided.*
- 1.29 *Owner's Representative - The person, firm or corporation named by the Owner to act as the Owner's agent.*
- 1.30 *Partial Utilization - Use by the Owner of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.*
- 1.31 *Project - The entire Work as described in the Contract Documents, including Work that is necessary and incidental to the furnishing of all materials, services, equipment, labor and supplies required to install, perform, and complete all items of Work in accordance with Contract Documents*
- 1.32 *Reference Standards - Those bulletins, standards, rules, methods of analysis or test, codes, and specifications of other agencies, engineering societies, or industrial associations referred to in the Contract Documents. These refer to the latest edition, including amendments in effect and published at the time the Project was advertised, unless specifically referred to by edition, volume, or date.*
- 1.33 *Regional Construction Standards - The construction standards, published by the Hampton Roads Planning District Commission (HRPDC) as amended from time to time.*
- 1.34 *Responsible Bidder - A person or firm who, in the sole opinion of the Owner, has the capability in all respects, to fully perform the contractual requirements as well as the moral and business integrity and reliability to assure good faith performance.*
- 1.35 *Responsive Bidder - A person or firm who has submitted a bid that conforms in all material respects to the Bid Documents.*
- 1.36 *Resident Project Representative - The authorized representative of the Engineer or Owner who is assigned to the Project or any part thereof.*
- 1.37 *Roadway Prism - All of the land or area within the right of way that needs to be cut, filled, graded, or otherwise disturbed to produce the design cross section, including, but not limited to, areas for curbs, ditches, sidewalks, paths, and slopes to match existing grade.*
- 1.38 *Rock - Any indurated material with a minimum compressive strength of 200psi that requires drilling, wedging, blasting, or other methods of brute force for excavation.*
- 1.39 *Shall - The term "shall" is mandatory.*
- 1.40 *Shop Drawings - All drawings, diagrams, illustrations, schedules, specified design related submittals, and other data or information which are specifically prepared or assembled by or for the Contractor and submitted by the Contractor to illustrate some portion of the Work.*
- 1.41 *Special Provisions - Requirements in addition to or modification of the HRPDC Regional Construction Standards.*
- 1.42 *Specifications - Those portions of the Contract Documents or HRPDC Regional Construction*

Standards consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

- 1.43 *Standard Details* - Those portions of the HRPDC *Regional Construction Standards* consisting of drawings, explanatory of another drawing, indicating in detail and at a larger scale, the design, location, composition and correlation of elements and materials.
- 1.44 *Subcontractor* - A person, firm or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work at the site.
- 1.45 *Substantial Completion* - That date certified by the Owner when the construction of the Project or a specified part thereof is sufficiently completed in accordance with the Contract Documents, including completion of all tests, so that the Project or specified part can be utilized for the purpose for which it is intended.
- 1.46 *Successful Bidder* - The lowest, responsible and responsive Bidder to whom the Owner (on the basis of the Owner's evaluation as hereinafter provided) makes an award.
- 1.47 *Supplier* - Any person or organization that supplies materials or equipment for the Work, including that fabricated to a special design.
- 1.48 *Underground Facilities* - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.
- 1.49 *Work* - All labor, materials, equipment, transportation, supervision, or other facilities, duties or incidentals necessary for execution and completion of the Project in compliance with the Contract Documents.

End of Section

SECTION 102

BIDDING REQUIREMENTS AND CONDITIONS

I. INVITATION FOR BIDS

PROJECT: 36-Inch Raw Water Main Improvements- Replacement of Western Branch Elizabeth River Crossing (Line 2)

LOCATION: Crossing the Western Branch of the Elizabeth River, from Bruce Station in Chesapeake, VA to Sandie Point Road in Portsmouth, VA

CONTACT NAME AND NUMBER: Daniel Riley, City of Norfolk, (757) 664-6740

The City of Norfolk will receive sealed Bids for the above titled Project at the office of the Department of Utilities located at 400 Granby Street, 2nd floor, Norfolk, VA 23510 until **3:00 PM** local time on **Wednesday, April 29, 2015**, at which time the Bids will be publicly opened and read aloud. Any Bids received after the specified time and date will not be considered.

The Work under this project includes, but is not limited to: Furnishing all labor, equipment, material, supplies, permits and fees required for the installation of approximately 2,000 linear feet (measured horizontally, not including vertical curvature) of 36-inch steel water main by the horizontal directional drill (HDD) method and an additional 300 linear feet of steel pipe by open trench construction. Also included are approximately 600 linear feet of ductile iron pipe and all appurtenances required to connect to the existing 36-inch raw water main (36-inch prestressed concrete cylinder pipe), etc. as shown on the Plans and in accordance with the Contract Documents.

The full Invitation For Bids is available at the Department of Utilities (757-664-6701), on the City of Norfolk's web site, <http://www.norfolk.gov/Bids.aspx>, on the DemandStar web site, <http://www.demandstar.com>, and in the local office of Builders and Contractors Exchange, Inc. (757- 858-0680) and the Virginia Minority Supplier Development Council (757-823-4587). Electronic copies of the bid documents are available at no cost online at <http://www.norfolk.gov/Bids.aspx> under the "Utilities" heading. All Bidders and anyone wishing to receive addenda to the Bid Documents must be on the Plan Holders List. The procedure for registration on the Plan Holders List follows: go to <http://www.norfolk.gov/Bids.aspx> under the "Utilities" heading, click on this project's title in the first screen, click on the Plan Holders List on the second screen and complete the registration form. Contact the Project Manager if you have any questions regarding downloading the Bid Documents or Plan Holders registration. The Bid Documents may be examined at the office of the Department of Utilities located at 400 Granby Street, Norfolk, Virginia 23510. A set of the Bid Documents may be purchased directly from the Department of Utilities for a **non-refundable payment of \$50.00. Only Checks or Money Orders made payable to "Department of Utilities" are acceptable.**

It is the policy of the City of Norfolk to facilitate the establishment, preservation, and strengthening of small businesses and businesses owned by women and minorities and to encourage their participation in the City's procurement activities. Toward that end, the City encourages these firms to compete and encourages non-minority firms to provide for the participation of small businesses and businesses owned by women and minorities through partnerships, joint ventures, subcontracts, and other contractual opportunities. Bidders (offerors) are asked, as part of their submission, to describe any planned use of such businesses in fulfilling this contract.

“Bidders must comply with the following: the President’s Executive Order #11246 prohibiting discrimination in employment regarding race, color, creed, sex, or national origin; the President’s Executive Order #12138 and 11625 regarding utilization of MBE/WBE firms; the Civil Rights Act of 1964. Bidders must certify that they do not or will not maintain or provide for their employees any facilities that are segregated on the basis of race, color, creed, or national origin.” By execution of the Bid Form and Contract Documents the contractor certifies to the aforementioned requirements.

The Hampton Roads Planning District Commission’s *Regional Construction Standards, Fifth Edition, December 2010*, are hereby referenced and are part of the Bid Documents, except as may be modified by the Special Provisions of this Project or as may be shown by bold type for additions and strike-throughs for deletions. Copies of the *Regional Construction Standards* may be purchased at the offices of the HRPDC, 723 Woodlake Drive, Chesapeake, VA 23320 (Telephone 757-420-8300) or Executive Tower, Suite 1-C, 2101 Executive Drive, Hampton, VA 23666 (Telephone 757-262-0094). The latest edition of the *Regional Construction Standards* and Publication Updates may be downloaded at the HRPDC website http://www.hrpdcva.gov/Regional_Construction_Stnds/REGCONST_Home.asp

Bid Security in the amount of five percent (5%) of the Bid shall be submitted with each Bid.

A NON-MANDATORY PRE-BID CONFERENCE will be held on, **Wednesday, April 15, 2015 at 10:00 a.m.** Local Time at **400 Granby Street, Norfolk, VA.** **Bidders must be present at the start of this meeting.**

Contractor registration in accordance with Title 2.2 Chapter 43, Code of Virginia is required. The Bidder shall include in its Bid the following notation: "Licensed Virginia Contractor No. _____." **Evidence of a Class A Certificate of Registration must be shown before the bid may be received and considered under a general or sub-contract of \$40,000.00 or more or when the volume of work is \$300,000.00 or more within any given twelve (12) month period. For jobs of at least \$1,500.00 but less than \$40,000.00, bidders are required to show evidence of a Class B Certificate of Registration. Under the aforesaid law, it is a Class I misdemeanor to bid or engage in any work without appropriate Class A or Class B license. The State Registration number must appear on the envelope containing the bid whenever the bid amounts to \$1,500.00 or more.**

Bidder or offeror organized or authorized to transact business in the Commonwealth pursuant to Title 13.1 or Title 50 to include in its bid or proposal the identification number issued to it by the State Corporation Commission.

Any bidder or offeror that is not required to be authorized to transact business in the Commonwealth as a foreign business entity under Title 13.1 or Title 50 or as otherwise required by law shall include in its bid or proposal a statement describing why the bidder or offeror is not required to be so authorized.

Withdrawal of Bids due to error shall be subject to and in accordance with Section 2.2-4330 of the Code of Virginia and the Contract Documents. **Procedures for submitting, withdrawing and evaluating Bids and other pertinent information are contained in the Instructions to Bidders. All bids will be evaluated in accordance with the City of Norfolk Procurement Procedures and the City reserves the right to waive informalities and to reject bids. The decision to award will be posed in a designated public area in accordance with Virginia Code 11-66(A).**

All construction contracts must comply with Section 33, 1-58 of the Code of the City of Norfolk, VA 1979, as amended, regarding Substance Abuse and Drug-Free Work Place policy for City Construction Contracts. (See Appendix A)

The Owner reserves the right to waive minor non-substantive informalities in the Bid, to reject any/or all Bids, to award any Bid in whole or in part and award the Bid considered to be in the best interest of the Owner. The Owner also reserves the right to negotiate with the lowest responsive, responsible Bidder should Bid exceed available funds.

The City of Norfolk does not discriminate in the solicitation or awarding of contracts on the basis of race, religion, faith-based organizations, color, national origin, age, disability or any other basis prohibited by state or federal law.

By: Cheryl F. Barnett, P.E.
Engineering Manager – Department of Utilities

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II. INSTRUCTIONS TO BIDDERS

1. Bid Documents

- 1.1. Complete sets of Bid Documents shall be used in preparing Bids. Neither the Owner nor the Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bid Documents.
- 1.2. The Owner, in making copies of the Bid Documents available on the above terms does so only for the purpose of obtaining Bids on the Work and does not confer or license or grant permission for any other use.
- 1.3. The Special Provisions for this Project as set forth in Section 110 were prepared by **Michael Baker Jr., Inc.** and are dated **February 2015**. Additional Special Provisions for this Project appear as modifications to the HRPDC *Regional Construction Standards* by strike-throughs for deletions and bold type for additions in Sections 100 through 109.
- 1.4. The Drawings for this Project, prepared by **Michael Baker Jr., Inc.** and dated February 2015, are defined as follows:

<u>Sheet No.</u>	<u>Description</u>
1	Cover Sheet
2	General Notes & Legend
3	General Notes
4	Erosion and Sediment Control Notes & Details
5	Plan & Profile- Overall Project Area
6	Plan View- West Side Interconnection and HDD Work Area
7	Plan View- East Side Interconnection and HDD Work Area
8	Plan & Profile - West Interconnection
9	Plan & Profile – East Interconnection
10	Raw Water Main Notes and Details
11	Temporary Traffic Control Notes & Details
12	Corrosion Control Plan
13	Corrosion Control Details
14	Corrosion Control Details
15	Corrosion Control Details

2. Examination of Contract Documents and Project Site.

- 2.1. It is the responsibility of each Bidder before submitting a Bid:
 - A. to examine thoroughly the Bid Documents;
 - B. to visit the site to become familiar with and satisfy the Bidder as to the general, local and site conditions that may affect cost, progress, performance, or furnishing of the Work;
 - C. to study and carefully correlate the Bidder's knowledge and observations with the Bid Documents and such other related data; and,

- D. to promptly notify the Owner of all conflicts, errors, ambiguities or discrepancies which the Bidder has discovered in or between the Bid Documents and such other related documents or field/site conditions.
- 2.2 Reference is made to Sections 104 III and 104 IV, for information relating to reports, explorations, underground facilities, and easements. On request, at the discretion of the Owner, the Owner will provide each Bidder access to the site to conduct such examinations, investigations, explorations, tests and studies as each Bidder deems necessary for submission of a Bid. The Bidder shall fill all holes and clean up and restore the site to its former condition, including reseeding and/or resodding any disturbed areas upon completion of such explorations, investigations, tests and studies, and hold the Owner harmless from any damage to property or injury to persons resulting from or arising out of such exploration, investigation, tests, and studies. The Bidder shall obtain and comply with all local and state permitting requirements.

3. Interpretations and Addenda.

- 3.1. No oral explanation in regard to the meaning of the Contract Documents will be made, and no oral instructions will be given before the award of the Work. Discrepancies, omissions or doubts as to the meaning of the Contract Documents shall be communicated in writing to the Owner for interpretation. Bidders should act promptly and allow sufficient time for a reply to reach them before the submission of their Bids. Any interpretation made will be in the form of an addendum to the Contract Documents, which will be forwarded to all known Bidders, and its receipt shall be acknowledged on the Bid Form. All questions shall be received no later than 7 days prior to the date for opening of Bids.
- 3.2. Addenda may also be issued to modify the Contract Documents.

4. Bid Security.

- 4.1. Each bid shall be accompanied by a Bidder's bond issued by a company authorized and licensed to transact business as surety in the Commonwealth of Virginia, a certified check, or cash escrow, in an amount equal to not less than five (5) percent of the total amount of the bid, made payable to the City of Norfolk, Virginia. Upon approval of the Owner's attorney, in accordance with Section 2.2-4338, Code of Virginia, 1950, as amended, a Bidder may furnish a ~~personal bond~~, property bond, or bank or savings and loan association's letter of credit on certain designated funds for the amount required for the Bid Security. The Bid Security shall be accompanied by a certified copy of the power of attorney for the surety attorney-in-fact. Said bid security shall be left with the Owner, subject to the conditions specified herein, as a guarantee of good faith on the part of the Bidder that if the bid is accepted, the Bidder shall execute the contract. **If a certified check is offered as guarantee, it shall be made payable to the 'City Treasurer of Norfolk, VA.'**
- 4.2. The Bid Security shall be returned to all except the three (3) lowest Bidders within ten (10) days after the date of Bid opening. The Bid Security will be returned to the three (3) lowest Bidders within five (5) days after the execution of an Agreement and Performance and Payment Bonds and Certificates of Insurance have been approved by the Owner. None of the three (3) lowest Bids shall be deemed rejected, notwithstanding acceptance of one of the Bids, until the Agreement has been executed by both the Owner and the Successful Bidder.

5. Liquidated Damages.

5.1. Provisions for liquidated damages are set forth in Section 108-X and in Section 102 III (Bid Form).

6. Preparation of Bid.

6.1. All blanks on the Bid Form shall **legibly and carefully** be completed in ink.

6.2. Bids by corporations shall be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.

6.3. Bids by unincorporated organizations shall be executed in the organization's name and signed by an individual having authority to enter into a contract on behalf of such organization, whose title shall appear under the signature and the official address of the organization shall be shown below the signature. For example, if such organization is a Limited Liability Company, the Bid shall be signed by its manager, or if such organization is a Limited Partnership, the Bid shall be signed by a general partner.

6.4. All names shall be typed or printed in ink below the signature. All names shall be the legal name of the corporation, unincorporated organization and/or individual.

6.5. The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which shall be filled in on the Bid Form).

6.6. The address, telephone number, e-mail address and fax number for communications regarding the Bid shall be provided.

6.7. It is understood and agreed that, in the event an Agreement is executed for the supplies, equipment or services included in the Bid, no indication of such sales or services to the Owner shall be used in any way in product literature or advertising without the written consent of the Owner.

7. Quantities and Unit Prices.

7.1. The Owner reserves the right to increase or decrease the amount of any class or portion of the Work. No such change in the Work shall be considered as a waiver of any condition of the Agreement nor shall such change invalidate any of the provisions thereof. Payment will be made at the unit or lump sum prices under the Agreement only for the work actually performed or materials furnished and accepted.

7.2. Bidders shall include in their Bid prices the entire cost of each item set forth in the Bid, and it is understood and agreed that there is included in each lump sum or unit price bid item the entire cost necessary or incidental to the completion of that portion of the work, unless such incidental work is expressly included in other lump sum or unit price bid items.

8. General Equipment or Material Specification.

8.1. When the Bid Documents specify one or more manufacturer's brand names or makes of materials, devices or equipment as indicating a quality, style, appearance or performance, with the statement "or

equal," the Bidder shall base the Bid on either one of the specified brands or an alternate brand which the Bidder intends to substitute. Use of an alternate shall not be permitted unless it has been found to be equal or better by the Owner and at no additional cost to the Owner.

- 8.2. The burden of proof as to the comparative quality and suitability of alternative equipment, articles or materials shall be upon the Bidder. The Bidder shall furnish at its own expense, such information relating thereto as may be required by the Owner. The Owner shall be the sole judge as to the comparative quality and suitability of alternative equipment, articles or materials and the Owner's decisions shall be final. Any other brand, make or material, device or equipment which, in the opinion of the Owner is recognized to be the equal of that specified, considering quality, workmanship and economy of operation and is suitable for the purpose intended, shall be accepted. In the event of any adverse decision by the Owner, no claim of any sort shall be made or allowed against the Engineer or Owner. Samples, if requested by the Bidder, may be returned at the Bidder's expense.
- 8.3. If in the sole discretion of the Owner an item proposed by the Contractor does not qualify as an "or equal" item it may be considered as a proposed substitute item. The Contractor shall furnish the Owner any such information as the Owner may request to evaluate the substitute item to include estimates of costs or credits, redesign, claims or schedule impacts, warranty or maintenance issues or payment of any license or royalty that could directly or indirectly result from acceptance of the substitute. Any cost or time impacts to the project schedule caused by the Contractor's submission of a substitute shall be borne by the Contractor. Any costs incurred by the Owner or by the Owner's Engineer in reviewing the suitability of the substitute item shall be borne by the Contractor. The Owner may refuse to accept a substitute unless an acceptable adjustment in the contract price is offered by the contractor.

9. Proprietary Material and Equipment Specification.

- 9.1 Where any item of equipment or material is specified by proprietary name, trade name, catalog reference, or name of one or more manufacturers, without the addition of such expressions as "or equal," it is to be understood that those items are so specified for reasons of standardization in maintenance and operation, or for reasons of obtaining desirable features best suited to the requirements of the Specifications. This specific equipment shall form the basis of the Bid and be furnished under the Agreement. Where two or more items of equipment or material are named, the Contractor has the option to use either.

Additive/Alternate Bids

10.1. Additive Bids

Additive bid items are those in addition to the base Bid items. Bidders shall submit additive Bids on all items as shown on the Bid form. Award shall be based on the lowest responsive and responsible Bid for base Bid plus all additive bid items listed and in accordance with any criteria in the Special Provisions.

10.2. Alternate Bids

Alternate bid items are those where more than one type of improvement may be considered for a portion or all of the Work due to the character of the improvement and uncertainties which may be encountered during construction. If alternate Bids are requested for a portion of or all of the Work,

Bidders shall submit alternate Bids for all alternate(s) the Bidder or its Subcontractor is qualified to perform. Award shall be based on the lowest responsive and responsible Bid for the base Bid plus the amount added or deleted for the alternate bid items selected by the Owner and in accordance with any criteria in the Special Provisions. The alternates selected shall be at the sole discretion and in the best interests of the Owner.

11. Submission of Bids.

- 11.1. Bids shall be submitted at the time and place indicated in the Invitation for Bids and shall be sealed, marked with the Project title and name and address of the Bidder, and accompanied by the bid guarantee and other required documents. The Bid may not be changed by markings on the envelope. Only the amounts indicated on the Bid Form will be considered in determining the final Bid amount.
- 11.2. When a license is required, the Bidder shall include in its Bid over the Bidder's signature the following notation: "VIRGINIA LICENSED CONTRACTOR NO. _____" (Ref. Title 2.2, Chapter 43, and Title 54.1, Chapter 11, Code of Virginia).
- 11.3. When a license is not so required and a person who is not the holder of a License enters a Bid, such person shall include in its Bid over the Bidder's signature the following notation: "LICENSING NOT REQUIRED UNDER VIRGINIA STATE CODE."
- 11.4. The Contractor shall complete and submit the Debarment Certification form. A copy of the form is included in Section 102, VI at the end of this Section.
- 11.5. The Contractor shall complete and submit the Non Collusion Affidavit form. A copy of the form is included in Section 102, III.K in this section.
- 11.6. The Contractor shall complete and submit the Questionnaire form. A copy of the form is included in Section 102 V. in this section.**

12. Receipt and Opening of Bids.

- 12.1. Bids will be opened publicly at the time and place and under the conditions stated in the Invitation for Bids. The Owner's Representative whose duty it is to open Bids will decide when the specified time has arrived. No responsibility will be attached to any such person for the premature opening of a Bid not properly addressed and identified. It is the responsibility of the Bidder to assure that the Bid is delivered to the designated place of receipt prior to the time set for the receipt of Bids. No Bid received after the time designated for receipt will be considered.
- 12.2. Bids will be opened and read aloud publicly.

13. Bids to Remain Subject to Acceptance.

- 13.1. All Bids shall remain subject to acceptance for 90 Days after the day of the Bid opening, but the Owner may, in its sole discretion, release any Bid and return the Bid Security prior to that date, or extend the acceptance period an additional 90 days with the consent of the apparent low bidder and surety.

14. Withdrawal of Bids.

- 14.1 Withdrawal of Bids filed with the Owner may be made only by a representative of the firm submitting the Bid, who shall appear in person prior to the deadline designated in the advertisement for receipt of Bids. Such representative shall furnish satisfactory identification and proof that they are authorized to withdraw the Bid. Telephone, e-mail, or facsimile notices will not be considered. Additions and/or deletions marked on the outside of the Bid envelope will not be considered.
- 14.2 In accordance with Section 2.2-4330(A)(i) of the Code of Virginia, as amended, If the Bid price was substantially lower than the other Bids solely to a mistake therein, provided the Bid was submitted in good faith, and the mistake was a clerical mistake as opposed to a judgment mistake, and was actually due to an unintentional arithmetic error or an unintentional omission of a quantity of work, labor, or material made directly in the compilation of a bid, which unintentional arithmetic error or unintentional omission can be clearly shown by objective evidence drawn from inspection of original work papers, documents, and materials used in the preparation of the Bid sought to be withdrawn and provided further the Bidder shall give notice in writing of his claim of right to withdraw within two (2) business days after the Bid opening, then the Bid may be withdrawn. The Bidder shall, within the following two (2) business days provide the subjective data required in this section to satisfy the Owner's representative that the grounds for such withdrawal do exist.
- 14.3 Should the Bidder refuse to enter into the Agreement after notification of award, the Bid Security shall be forfeited.
- 14.4 No Bid may be withdrawn under this section when the result would be the awarding of the Agreement on another Bid to the same Bidder or to another Bidder in which the ownership of the withdrawing Bidder is more than five percent.
- 14.5 If a Bid is withdrawn under the authority of this section, the remaining Bids shall be evaluated to determine the lowest responsive and responsible Bidder.
- 14.6 No Bidder who is permitted to withdraw a Bid shall, for compensation, supply any material or labor to or perform any subcontract or other work agreement for the person or firm to whom awarded, or otherwise benefit, directly or indirectly, from the performance of the Project for which the withdrawn Bid was submitted.
- 14.7 If withdrawal of any Bid is denied, the Bidder shall be notified in writing stating the reasons for this decision. Any Bidder who desires to appeal a decision denying withdrawal of Bid shall, as sole remedy, institute legal action provided by Section 2.2-4358 and Section 2.2-4364(B), Code of Virginia, 1950, as amended.

15. Evaluation of Bids.

- 15.1. In evaluating Bids, the Owner shall consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, unit and lump sum prices, and additive/alternate bid items if requested in the Bid Form.
- 15.2. The Owner may consider the qualifications and experience of subcontractors and other persons and organizations (including those who are to furnish the principal items of material or equipment) proposed for those portions of the Work for which the identity of Subcontractors and other persons and organizations shall be submitted as specified in the Bid Documents.

- 15.3. The Owner may conduct such investigations as deemed necessary to establish the responsibility, qualifications and financial ability of the Bidders, proposed Subcontractors and other persons and organizations to do the Work in accordance with the Bid Documents to the Owner's satisfaction within the prescribed time.
- 15.4. Bids will be based upon the estimated quantities shown in the Bid Form. Bids will be compared on the basis of a total computed price; arrived at by taking the sum of the estimated quantities of each Bid Item, multiplied by the corresponding unit price bid, and any lump sum Bids on the individual items. Discrepancies between the multiplication of units of work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of **words figures**. The right to reject any or all Bids or to accept any Bid considered of advantage to the Owner is reserved.
- 15.5. Unless all Bids are canceled or rejected, the Owner reserves the right granted by Section 2.2-4318 of the Code of Virginia and Section(s), as amended, to negotiate with the lowest responsible, responsive Bidder to obtain a Contract Price within the funds budgeted for the construction project. Negotiations with the lowest Bidder may include both modification of the Contract Price and the Scope of Work/Specifications to be performed. The Owner shall initiate such negotiations by Written Notice to the lowest responsible, responsive Bidder that its Bid exceeds the available funds and that the Owner wishes to negotiate a lower Contract Price. The Owner and the lowest responsive, responsible Bidder shall agree to the times, places, and manner of negotiations.
- 15.6. The acceptance of a Bid will be a notice in writing, signed by the Owner, and no other act shall constitute the acceptance of a Bid.
- 15.7. The Owner reserves the right to waive minor informalities in the Bid, to reject any /or all Bids, to award any Bid in whole or in part, and to award the Bid considered to be in the best interest of the Owner.

16. Qualifications of Bidders and Subcontractors.

- 16.1. The Contractor's Questionnaire is included in the Bid Documents and shall be submitted **with the Contractor's Bid Document Package.** ~~upon request within 72 hours.~~ This information will assist the Owner in investigations and determination of the Contractor's qualifications to perform the Work.
- 16.2. To demonstrate their qualification to perform the Work, each Bidder shall be prepared to submit further written satisfactory evidence that the Bidder has sufficient experience, necessary capital, materials, machinery and skilled workers to complete the Work. If financial statements are required they shall be of such date as the Owner shall determine and shall be prepared on forms acceptable to the Owner. The Owner may make such investigations as deemed necessary to determine the ability of the Bidder to perform the Work. The Owner's decision or judgment on these matters shall be final, conclusive and binding.
- 16.3. Installation Experience of Bidder:
- A. The Contractor shall thoroughly familiarize itself with all specific manufacturing and installation requirements of the pipe material bid.
 - B. The Contractor shall employ and provide the fulltime onsite services of a competent superintendent. This superintendent shall have been in full charge of installing at least 5,000 linear feet of 36-inch, or greater, diameter water pipeline and/or sewer force main,

in field conditions similar to those of this project.

- C. The Contractor shall submit written evidence of having satisfactorily completed at least three (3) water main installation contracts, within the past 5 years, of similar size, quantity and complexity, including Superintendent's experience in installing the pipe material and joint types to be used, project titles, pipe diameter and length, locations, reference contacts, addresses, and telephone numbers.
- 16.4. **The apparent low bidder shall, within seven consecutive days after the day of the bid opening, submit to the Owner a list of all Subcontractors who will be performing work on the Agreement.** Such list shall be accompanied by an experience statement with pertinent information as to similar projects and other evidence of experience and qualification for each such Subcontractor, person and organization. If the Owner, after due investigation, has reasonable objection to any proposed Subcontractor, other person or organization, the Owner may, before giving the Notice of Award, request the apparent low Bidder to submit an acceptable substitute without an increase in Bid price. If the apparent low Bidder declines to make any such substitution, the contract shall not be awarded to such Bidder, but his declining to make any such substitution will not constitute grounds for sacrificing his Bid Security. For any Subcontractors, other person or organization so listed and to whom Owner does not make written objection prior to the giving of the Notice of Award, it will be deemed the Owner has no objection.
- 16.5. By submitting their Bid, Bidders certify that they are not now debarred by the Federal Government or by the Commonwealth of Virginia or by any other state, or by any town, city, or county, from submitting Bids on contracts for construction covered by this solicitation, nor are they an agent of any person or entity that is now so debarred.
- 16.6. If the Bidder is organized as a stock or nonstock corporation, a limited liability company, a business trust, or a limited partnership, or is registered as a registered limited liability partnership, the Bidder must be authorized to transact business in the Commonwealth as a domestic or foreign entity if so required by Title 13.1 or Title 50 of the Code of Virginia, or as otherwise required by law. The Bidder shall include the identification number issued by the State Corporation Commission on the Bid form or describe why the Bidder is not required to be so authorized. Any Bidder failing to do so shall not be awarded the Contract unless the Owner issues a waiver of this requirement and administrative policies and procedures are established by the locality. If the Bidder allows its existence to lapse, or its certificate of authority or registration to transact business in the Commonwealth of Virginia to expire, or be revoked or cancelled, such will be deemed as an act of default enabling the Owner to all remedies for default, including but not limited to revocation of this Agreement.
- 17. Sham or Collusive Bids.**
- 17.1. The Bids of any Bidder or Bidders who engage in collusive bidding shall be rejected. Any Bidder who submits more than one Bid in such a manner as to make it appear that the Bids submitted are on a competitive basis from different parties shall be considered a collusive Bidder.
- 17.2. The provisions contained in Sections 2.2-4367 through 2.2-4377, Code of Virginia, as amended, ~~and Section(s) _____ of the Code of the City/County of _____ Virginia, as amended,~~ shall be applicable to all contracts solicited or entered into by Owner. By submitting their Bids, all Bidders certify that their Bids are made without collusion or fraud, and that they have not offered or received any kickbacks or inducements from any other Bidder, Supplier, manufacturer

or subcontractor in connection with their Bid, and they have not conferred with any public employee having official responsibility for this procurement transaction, any payment, loan, subscription, advance, deposit of money, services or any thing of more than nominal value, present or promised, unless consideration of substantially equal or greater value was exchanged.

18. Time of Essence

18.1 As the provisions hereof relating to the time for performance and completion of the Work are for the purpose of enabling the Owner to proceed with the construction of public improvements in accordance with pre-planned programs, such provisions are of the essence.

19. Project Documents

19.1 **The Hampton Roads Planning District Commission Regional Standards Fifth Edition are hereby defined as the City of Norfolk, Department of Utilities Standard Specifications, Department of Public Works Standard Specifications, latest edition and the accompanying Project Documents are intended to supplement each other, so that anything shown on the accompanying Project Documents but not mentioned in the specifications, or vice versa, shall be required as if both specified and shown. In the event of a conflict between the standards and specifications referenced herein, the order of precedence shall be as follows: Special Provisions, Project Documents, Regional Standards, City of Norfolk Department of Utilities Standard Design Criteria, City of Norfolk Department of Public Works Standard Specifications, Supplemental Specifications.**

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III. BID FORM

Bids to be opened:	Time 3:00 p.m., Wednesday, April 29, 2015
Work to be Completed in:	Substantial Completion: 260 Calendar Days Final Completion: 290 Calendar Days
Liquidated Damages:	One Thousand Dollars and No Cents (\$100 0.00) per calendar day after time for Substantial Completion has expired. Five Hundred Dollars and No Cents (\$500. 00) per calendar day after time for Final Completion has expired.
Performance Bond:	100%
Payment Bond:	100%
Bid Security:	5%

Contractor and owner recognize that time is of the essence of this agreement and that the owner will suffer financial loss if the work is not completed within the times specified, plus any extensions thereof allowed in accordance with the contract documents. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the owner if the work is not completed on time. Accordingly, instead of requiring any such proof, owner and contractor agree that as liquidated damages for delay (but not as penalty), contractor shall pay owner One Thousand Dollars and No Cents (\$1000.00) for each calendar day that expires after the time specified for substantial completion until the work is substantially complete. After substantial completion, if contractor shall neglect, refuse, or fail to complete the remaining work within the contract time or any proper extension thereof granted by owner, contractor shall pay owner Five Hundred Dollars and No Cents (\$500.00) for each calendar day that expires after the time specified for final completion and readiness for final payment until the work is completed and ready for final payment. If substantial completion is not achieved by the time of final completion then liquidated damages for both substantial and final completion shall run concurrently until substantial completion is achieved.

To: Director of Utilities
City of Norfolk, Virginia

A. BID PRICE

OPTION A - LUMP SUM BID
NOT USED

OPTION B - COMBINATION LUMP SUM AND UNIT PRICE BID
NOT USED

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OPTION C - UNIT PRICE BID

In compliance with the Bid Documents, titled **36-inch Raw Water Main Improvements - Replacement of Western Branch Elizabeth River Crossing (Line 2)**, all Addenda issued to date all of which are part of this Bid, the undersigned hereby proposes to furnish all items including materials, supervision, labor, and equipment in strict accordance with, said Contract Documents, for the sum of:

NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
1	36- inch Steel Water Main- HDD & Open Cut	1	LS		
2	36-inch Ductile Iron Water Main	598	LF		
3	Removal of Existing 36-inch Conc. RWM from Western Branch - Elizabeth River	1	LS		
4	Ductile Iron Fittings- 36-inch	2	EA		
5	Concrete to DI or Steel Pipe Adapters	2	EA		
6	Temporary Shoulder Pavement	250	SY		
7	Select Backfill	1,200	CY	\$35.00	\$49,000.00
8	Select Bedding, No. 57 Stone	140	TON	\$38.00	\$5,700.00
9	Flowable Fill for Pipe Abandonment	500	CY		
10	Test Pits	10	EA		
11	Curb / Curb and Gutter	420	LF		
12	Miscellaneous Concrete	10	CY		
13	Undercut and Dispose	100	CY		
14	Aggregate Stone Base	220	TON		
15	Asphalt Base Course BM-25	250	TON		
16	Asphalt Surface Course SM-9.5	190	TON		
17	Corrosion Protection System	1	LS		
18	Adjust 8-inch Water Main and Service Connections	1	LS		
19	Air Vacuum Release Valve and Manhole	2	EA		
20	Partially Remove Existing Air Vent Manhole and Pipe	2	EA		
TOTAL PRICE BID (in numbers)					
TOTAL PRICE bid (in words) _____					

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities provided, determined as provided in the Contract Documents. The prices quoted shall include without exception all materials, supervision, labor, equipment, appliances, clean-up, incidental items, applicable sales, use and other taxes, insurance, building permit or fees, and the Contractor's labor, overhead, profit, mobilization and other mark-ups, and in full accordance with the Contract Documents. Include allowance for waste where appropriate. The unit prices shall be maintained throughout the Contract Time. Unit prices shall be used in determining additions or deductions from the total Contract Price in the event of changes due to unforeseen conditions in the Work.

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B. ADDENDA

The undersigned acknowledges receipt of the following addenda:

Addendum No. _____ Dated: _____.

Addendum No. _____ Dated: _____.

Addendum No. _____ Dated: _____.

C. We agree to enter into an Agreement with the City of Norfolk, Virginia within ten (10) days of the award of same to us for the price named in our Bid.

D. It is expressly agreed by us that the City of Norfolk, Virginia shall have the right to reject any and all Bids and to waive any minor non-substantive errors in the Bid and accept the Bid in the City of Norfolk's best interests.

E. In default of the performance on our part of the conditions of Bid, our failure to enter into an Agreement with the City of Norfolk, Virginia, within the time above set, we herewith furnish a Bid Security in the amount of \$ _____, which shall be absolutely forfeited to the City of Norfolk, Virginia, but otherwise the said Bid Security shall be returned.

F. We agree to begin Work at any time we may be notified by the Owner, and complete all of the Work embraced in the Agreement within **290 Calendar Days**;

~~G. [This applies to projects over \$200,000 unless otherwise indicated]. We elect to utilize the Escrow Account Procedure described in the provision of this bid if determined to be the successful low Bidder. _____ (write "Yes" or "No").
_____ Bid total does not qualify for escrow account option~~

H. The undersigned has read all sections under "Instructions to Bidders."

I. **By signing the attached, the bidder certifies that a copy of the City of Norfolk Department of Utilities Standard Specifications is in the Bidder's possession, and that all work called for in the contract documents will be done in accordance with these specifications as prioritized in Section II.19.1.**

J. By signing, each signatory acknowledges any strike-throughs contained herein, unless hand-written.

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K. CONTRACTOR'S REGISTRATION, SCC NUMBER AND SIGNATURE

Registered Virginia Contractor Class and No. _____

Registration Expires _____

State Corporation Commission (SCC) Number _____

(NOTE: FAILURE TO INCLUDE CONTRACTOR'S REGISTRATION and SCC NUMBER ARE GROUNDS FOR REJECTION OF THE BID.)

Contractor _____ Signed _____

Date _____ Title _____

NOTE: If Bidder is a corporation, write state of incorporation under signature.

MAILING ADDRESS AND TELEPHONE/E-Mail/FAX NUMBER OF BIDDER:

() [Telephone] E-mail _____; FAX _____

IF CORPORATION, PROVIDE NAME AND MAILING ADDRESS AS REQUIRED BELOW.

PRESIDENT

SECRETARY

TREASURER

IF PARTNERSHIP, PROPRIETORSHIP, LIMITED LIABILITY COMPANY OR OTHER FIRM, PROVIDE NAME AND MAILING ADDRESS OF EACH PARTNER, PROPRIETOR, OR MEMBER OF FIRM.



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L. NON COLLUSION AFFIDAVIT

City of Norfolk, Virginia project: **36-Inch Raw Water Main Improvements Replacement of Western Branch Elizabeth River Crossing (Line 2)**

Bid Date: _____

COMMONWEALTH OF VIRGINIA
CITY OF NORFOLK

This day personally appeared before the undersigned, a Notary Public in and for the City/County and State aforesaid,

_____ who having been first duly sworn according to law, did depose and aver as follows:

- (a) That he/she is _____
(Owner, Partner, President, etc.)
of _____
(insert name of Bidder)
- (b) That he/she is personally familiar with the Bid of _____
(Insert Company Name)
submitted in connection with the above captioned Owner's project.
- (c) That said Bid was formulated and submitted in good faith as the true bid of said Bidder.
1. In preparation and submission of this Bid, the Bidder did not either directly or indirectly, enter into any combination or agreement with any person, firm or corporation or enter into any agreement, participate in any collusion, or otherwise take any action in the restraint of free, competitive bidding in violation of the Sherman act (15 U.S.C. Section 1) or sections 59.1-9.1 through 59.1-9.17 or sections 59.1-68.6 through 59.1-68.8 of the Code of Virginia.
 2. The undersigned Bidder hereby certifies that neither this Bid nor any claim resulting therefrom, is the result of, or affected by, any act of collusion with, or any act of another person or persons, firm or corporation engaged in the same line of business or commerce; and that no person acting for or employed by the Owner has any personal interest in this Bid.
 3. The undersigned hereby further agrees that upon request of the Owner, the records and books pertaining to this Bid will be voluntarily supplied, furnished, and released to the Owner.
 4. The undersigned hereby further certifies that the Bidder has not knowingly falsified, concealed, misled, or covered up by any trick, scheme, or device a material fact in connection with this bid. The undersigned also certifies that the Bidder has not made any false, fictitious or fraudulent statements or representations or made or used any false writing or documents knowing the same to contain any false, fictitious or fraudulent statement or entry in connection with this Bid.

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5. The undersigned further agrees that the Bidder will comply with section 2.2-4374 of the Code of Virginia, 1950, as amended, and has not bought or purchased any equipment from any person employed by the Owner as an independent contractor to furnish architectural or engineering services for this Project, nor from any partnership, association or corporation in which such architect or engineer has a pecuniary interest.
6. The undersigned further agrees to inform and require compliance by the following persons and entities with this anti-collusion statement as a condition of payment: all subcontractors, consultants, sub-consultants, or any person, corporation, or legal entities that provide or furnish labor, material, equipment, or work related to this project.
7. All Covenants and Agreements made by the Contractor are made by it on behalf of the Contractor and its successors, personal representatives and assigns, the same as if they had been specifically named in each instance.

And further this deponent saith not.

Name of Company/Bidder

Title (Owner, Partner, President)

Subscribed and sworn to before me this _____ day of _____, 20__

My commission expires: _____, 20__

Notary Public

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IV. BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____ as Principal, and _____ as Surety, are hereby held and firmly bound unto City of Norfolk as OWNER in the penal sum of _____ (Five Percent) for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____ day of _____, 20__.

The Condition of the above obligation is such that whereas the Principal has submitted to the OWNER a certain BID, attached hereto and hereby made a part hereof to enter into an Agreement in writing, for the

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver an Agreement in the Form of Agreement attachment hereto (properly completed in accordance with said BID) and shall furnish a BOND for faithful performance of said Agreement, and for the payment of all persons performing labor or furnishing materials in connection therewith, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year set forth above.

Principal

Surety

By: _____
Attorney-in-Fact

IMPORTANT - Surety companies executing BONDS shall appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the Commonwealth of Virginia.



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V. QUESTIONNAIRE

~~If requested by the Owner, the following questions shall be answered in full by the Bidder, and submitted with the signed Bid Form. returned to the Owner within 72 hours.~~

1. Name of Company: _____
Trade Name (if different from Company Name): _____
Principal Office Address: _____

Telephone No(s): _____
Fax No(s): _____

a. If a Corporation, answer the following:

When Incorporated: _____

In What State: _____

Names and Addresses of Directors: _____

Names and Addresses of Shareholders: _____

b. If an Unincorporated Organization, answer the following:

Date of Organization: _____

Names and Addresses of Owners or Members: _____

Type and State of Organization: _____

c. If a Partnership, state whether Partnership is General or Limited: _____

Names and Addresses of Owners or Partners:

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2. a. How many years has this Bidder been in business as a Contractor under its present business name? _____

b. What are prior names of this Bidder, if any? _____

3. How many years' experience in this type of construction work has this Bidder had:

1) As a Contractor _____ 2) As a Subcontractor _____

4. Provide a list of uncompleted Contracts at present held by this Bidder (attach supplemental sheet if necessary):

<u>Contract</u>	<u>Type of Work</u>	<u>Amount</u>	<u>Percentage Completed</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

5. List the Bidder's crew foremen and supervisors proposed for this Project and their years of related experience:

<u>Name</u>	<u>Years of Experience</u>	<u>Dates of Employment with Bidder</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

6. What construction equipment does this Bidder own that is available for the proposed work (attach supplemental sheet if necessary)?

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9. 9. Have you ever performed work for a municipal corporation, local governing body, or similar agency previously? (If all such bodies are listed under 8, this question need not be completed).

10. a. Has this Bidder ever failed to complete any work awarded to it? _____ If yes, give name of Owner, name of Bonding Company and circumstances:

b. Is this Bidder debarred by the Federal Government or by the Commonwealth of Virginia or by any other state, or by any town, city, or county?

Yes _____ No _____ If yes, please provide details:

c. Has this Bidder ever had any judgments entered against it for the breach of contract for construction? _____ If yes, please provide details:

d. Give a summary of your financial statement. (List assets and liabilities, use an insert sheet, if necessary).

11. State approximate largest dollar volume of work performed by this Bidder in one year:

12. Give two (2) Banking Institution References:

a. Name: _____

Address: _____

Credit Available: _____

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b. Name: _____

Address: _____

Credit Available: _____

13. List three material suppliers and amount of credit available:

_____	_____
_____	_____
_____	_____

14. List insurance coverage and amount (or attach certificate of insurance):

Liability-Property

Liability-Personal Injury

Vehicle and Equipment

Other - Identify

15. Bonding reference - List surety company and highest coverage:

16. Have you or your authorized representative, personally inspected the location of the proposed Work, and do you have a clear understanding of the requirements of the Bid Documents?

The undersigned hereby authorizes and consents to any person, firm or corporation to furnish any information requested by the Owner in verification of this statement of contractor's qualifications. Also, if it is the apparent low Bidder, the undersigned hereby agrees to furnish the Owner upon request, a complete and current financial statement:

Contractor: _____

By: _____

Title: _____ Date : _____

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VI. CERTIFICATION REGARDING DEBARMENT

This is to certify that this person/firm/corporation is not now debarred by the Federal Government or by the Commonwealth of Virginia or by any other state, or by any town, city, or county, from submitting Bids on contracts for construction covered by this solicitation, nor are they an agent of any person or entity that is now so debarred.

_____	_____
	Name of Official
_____	_____
Title	
_____	_____
	Firm or Corporation
_____	_____
	Date

End of Section

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SECTION 103

AWARD AND EXECUTION OF AGREEMENT

I. AWARD AND EXECUTION OF AGREEMENT

1. Notice of Award.

- 1.1. A Notice of Award will be issued by the Owner, or the Bids rejected as soon as reasonably possible, but no later than 90 Days after the date of the opening of Bids. The Owner may, in its sole discretion, release any Bid and return the Bid Security prior to that date, or extend the acceptance period an additional 90 days with the consent of the apparent low bidder and surety.
- 1.2. The Owner reserves the right to waive any minor informalities, to reject any and all Bids in whole or in part, and may advertise for new Bids if, in its judgment, the best interests of the Owner will be served.
- 1.3. At the time of the issuance of the Notice of Award, the Owner shall publicly post an announcement of the award on/at http://www.norfolk.gov/utilities/engineer/rfps_and_bids.asp

2. Signing of Agreement.

- 2.1. When the Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by 4 original copies of the Agreement, with all other written Contract Documents attached. Within 10 Days thereafter the Contractor shall sign and deliver all the original copies of the Agreement and attached documents to the Owner with the required Bid Security and Certificate of Insurance. Within 30 Days thereafter the Owner shall deliver one fully signed copy to the Contractor.
- 2.2. If the Successful Bidder fails to execute the Agreement within the time specified, the amount of Bid Security shall be paid to the Owner. In such case the Owner, at its discretion, may award the Work to the second Successful Bidder, or reject all Bids.

3. Performance and Payment Bonds.

- 3.1. The Successful Bidder shall execute and provide to the Owner, within 10 Days following Notice of Award, Performance and Payment Bonds with surety in an amount equal to 100% of the accepted Bid. The sureties of all Bonds shall be of such surety company or companies as are approved by the Owner and are authorized to transact business in the Commonwealth of Virginia. If the execution is by an attorney-in-fact, a power of attorney evidencing the authority of such attorney shall be attached to the Bond. Such power of attorney shall bear the same date as the Bond to which it is attached.
- 3.2. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws and Regulations and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U. S. Treasury Department.
- 3.3. Performance and Payment Bonds shall remain in full force during the warranty period defined in Section 107, VII.

4. Contractor's Insurance.

- 4.1. The Contractor shall provide and keep in full force and affect during the performance of the Work the kinds and amounts of insurance specified in Section 4.3 below and shall comply with all other provisions of this Section. Such insurance shall be provided and kept in full force by insurance companies authorized to do business in the Commonwealth of Virginia, and regulated by the Virginia Bureau of Insurance. All premiums and other costs of such insurance shall be paid by the Contractor. It will be assumed that the consideration paid or to be paid to the Contractor for the performance of the Work includes the premiums and other such costs of such insurance, and the Owner shall not be responsible therefore. Each insurance policy and certificate of insurance shall be signed by duly authorized representatives of such insurance companies in the State and shall be countersigned by duly authorized agents of such companies. The Contractor shall not be required to furnish the Owner with copies of the insurance contracts required by this Section unless requested from time to time by the Owner; but the Contractor shall provide on forms furnished by the Insurance Company or Owner a Certificate of Insurance issued by such Insurance Companies, in which the company shall irrevocably warrant that the insurance is provided to enable the Contractor to comply with and provide the required insurance; (provided, however, that in no event shall the insurance contract be expanded to afford coverage which is greater than the maximum coverage approved for writing in the Commonwealth of Virginia) and that it will not be canceled unless at least thirty days' prior written Notice to the effect is given to the Owner, anything in such insurance contract to the contrary notwithstanding, and that the insurance contract has been endorsed accordingly.
- 4.2. The Contractor shall provide the certificate of insurance to the Owner within 10 Days following the Notice of Award.
- 4.3. Insurance Requirements:
- A. The Contractor shall purchase and maintain during the life of this Agreement such Comprehensive General Liability Insurance including product and completed operations liability insurance as will provide protection from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether such performance is by Contractor, or by Subcontractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable and shall otherwise bear responsibility therefore. The Contractor further agrees that all limits will be made available which are excess of the amounts below:
- (1) Workers Compensation and Employers Liability
- Coverage A - Statutory
Coverage B - \$100,000/\$100,000/\$500,000
- A broad form of all states endorsement shall be attached.
- (2) Commercial Auto Liability Including Hired and Non-Owned Car Liability Coverage
- Limit of Liability - \$1,000,000 Per Occurrence

The Contractor shall purchase and maintain during the life of this Agreement such commercial automobile liability insurance including employer's non-ownership liability and hired car liability insurance to protect him and any Subcontractors performing Work covered by this Agreement from claims for damages, whether such operations be by him or any Subcontractor, or by anyone directly or indirectly employed by either of them.

- (3) Commercial General Liability Including Contractual and Completed Operations.

Limit of Liability - \$1,000,000 Per Occurrence

- (4) Excess Liability Including Employers Liability, Commercial Auto Liability and Commercial General Liability.

Limit of Liability - \$1,000,000 Per Occurrence

\$3,000,000 Aggregate

- B. The Contractor shall be responsible for securing the Work site and shall assume all risk for vandalism or other damage that may occur, to project components, during construction.
- C. The Owner shall be named as an additional insured on the Commercial General Liability per ISO 2010 on a primary basis. The Contractor shall obtain a waiver of subrogation from its insurers on Worker's Compensation and All Risk Insurance policies. This requirement may be satisfied by obtaining appropriate endorsements to any master or blanket policy of insurance maintained. Owner's Commercial General Liability shall not contribute in any loss payment insured under the Contractor's Commercial General Liability policy
- D. Contingent liability and property damage insurance to protect the Owner (or his employees and agents, including the Engineer) shall be provided by endorsements to general liability or property damage policies. All aforesaid policies shall be endorsed to provide that the insurance company shall notify the Owner if policies are to be terminated or altered during the life of the contract.
- E. The General Liability insurance shall carry a contractual liability endorsement covering the hold harmless agreements contained in the Owner standard contract and the certificates filed with the Owner shall show that the contractual liability coverage has been obtained.
- F. Insurance coverage for personal injury and property damage, including insurance on vehicles and equipment, shall be in the same company.
- G. The Contractor shall also be required to submit to the Owner evidence of insurance coverage or self-insurance for all claims arising under the Worker's Compensation Laws of the State of Virginia.
- H. The Contractor will indemnify and hold harmless the Owner, and the Owner's officers, agents, employees, and other representatives, against any liability, loss or expense (including the loss of use of the Project), due to any act or omission of Contractor or any of their Subcontractors or of any of their respective employees in connection with the Work of the Contractor hereunder or due to any omissions or supervisory acts of the Owner in connection with the Work performed by the Contractor.

II. NOTICE OF AWARD

TO: _____

PROJECT TITLE: 36-Inch Raw Water Main Improvements- Replacement of Western Branch Elizabeth River Crossing (Line 2)

The Owner has considered the Bid submitted by you for the above described Work in response to its Invitation for Bids dated _____, 20___, and Instructions to Bidders.

You are hereby notified that your Bid has been accepted for the Work in the amount of \$_____.

You are required by the terms of the Bid Documents to fully execute and return **all 4** copies of the Agreement along with the required Contractor’s Performance Bond, Payment Bond, and Certificates of Insurance, **and Procurement Information Form** within **10** Days from the date of this Notice of Award.

The Certificate of Insurance must name the City of Norfolk as beneficiary (additional insured). It should also be accompanied by a Government Cancellation Clause/Statement guaranteeing a 30-day written cancellation notice. The certificate should also show that you have obtained:

- 1. Workmen’s Compensation Insurance (including occupational diseases) covering the employees of the contractor and any of his subcontractors.**
- 2. Public Liability Insurance naming the City of Norfolk as additional insured.**
- 3. Comprehensive General Liability Insurance with contractual liability coverage of at least \$500,000/\$1,000,000 for bodily injury and \$250,000/\$500,000 for property damage.**
- 4. Automobile Liability Insurance including bodily injury and property damage for owned, non-owned, and hired vehicles with minimum limits per occurrence of \$500,000/\$1,000,000 for bodily injury and \$250,000/\$500,000 for property damage.**

Because these are requirements for all construction projects in the City of Norfolk, work on the project cannot begin until they are fulfilled.

As soon as the Agreement, bond forms, and certificate of insurance are submitted, the City will begin processing the necessary papers. You may begin work on the project after the Agreement and Notice to Proceed are issued to you.

The Hazards Communication Policy adopted by the Department of Utilities will be in effect during all work performed on and around City-owned facilities and properties. If you do not have a copy of this policy, please contact this office at 664-6701. We will be glad to send a copy to you.

If you fail to execute the Agreement and to furnish said Bonds and Certificate of Insurance within **10** Days from the date of this Notice, said Owner will be entitled to consider all your rights arising out of the Owner’s



acceptance of your Bid as abandoned and as a forfeiture of your Bid Security. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the Owner. The notice of award shall not be construed as notice to proceed.

Dated this _____ day of _____, 20__.

OWNER

CONTRACTOR

Owner
By: _____
Name
Title: _____

Contractor
By: _____
Name
Title: _____

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III. AGREEMENT

This AGREEMENT, dated this _____ day of _____, 20____, by and between **The City of Norfolk, Virginia, acting by and through the City Manager**, hereinafter called the Owner; and

(a corporation or an unincorporated organization organized and existing under the laws of the State of _____ or, an individual trading under the above name) hereinafter called the Contractor.

WITNESSETH: The Owner and Contractor, for the consideration stated herein, agree as follows:

A. Scope of Work

The Contractor shall perform all required Work and shall provide and furnish all labor, materials, necessary tools, expendable equipment and utility and transportation service and all else required to complete the construction of the **36-inch Raw Water Main Improvements Replacement of Western Branch Elizabeth River Crossing (Line 2)** project all in strict accordance with the Drawings and Specifications, including any and all Addenda, and in strict compliance with the Contract Documents, the terms of which are incorporated herein by reference.

It is understood and agreed that said labor, materials, tools, equipment and service shall be furnished and said Work performed and completed under the direction and supervision of the Contractor and subject to the approval of the Owner or its authorized representative.

B. Engineer

This Project has been designed by **Michael Baker Jr., Inc.** who is hereinafter called the Engineer. ~~and who is to~~ **However, the Norfolk Department of Utilities will** act as the Owner's Representative, assume all duties and responsibilities, and have the rights and authority assigned to the Engineer in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents. In the event the Owner should not require the services of the Engineer for any or all parts of the project, the power, duties, and responsibilities conferred hereto to the Engineer shall be construed to be those of the Owner or its authorized representative.

C. Guarantee

All materials and equipment, furnished by the Contractor, and all construction involved in this Agreement are hereby guaranteed by the Contractor to be free from defects owing to faulty materials or workmanship for a period of one year after date of **Final Completion** of the Work. All Work that proves defective, by reason of faulty material or workmanship within said period of one year, shall be replaced by the Contractor free of cost to the Owner. These guarantees shall not operate as a waiver of any of the Owner's rights and remedies for default under or breach of the Agreement which rights and remedies may be exercised at any time within the period of any applicable statute of limitations.

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D. Contract Price

The Owner shall pay the Contractor as just compensation for the satisfactory performance of the Work, subject to any additions or deductions as provided in **the contractor's bid, Section 102, Clause III Bid Form submitted (Bid Opening Date)**.

The Contract Price is _____ (\$ _____) based upon unit and/or lump sum prices extended as **submitted in the contractor's bid, Section 102, Clause III Bid Form dated (Bid Opening Date)**.

E. Payments

The Owner will pay the Contract Price to the Contractor in the manner and at such times as set forth in Section 109 of the Hampton Roads Planning District Commission *Regional Construction Standards*, Fifth Edition, as referenced in Section I. below and as specifically revised for this Project.

F. Time

The undersigned Contractor agrees to commence Work within **30 Days** after the date of Notice to Proceed and further agrees to substantially Complete all Work under this Agreement within **260 Days** from the date of the Notice to Proceed and to reach Final Completion of all Work under this Agreement within 290 Days from the date of the Notice to Proceed.

NOTE: The time(s) for completion include provisions for shop drawing review and lead time for pipe (and other material) deliveries, as well as weather delays associated with normal climate conditions. Such time shall also include the stipulation that the water main may be taken out of service for a period of no more than 60 days. The Contractor shall coordinate his request for shutdowns to facilitate interconnections to the existing main with the City and in conjunction with other concurrent projects associated with the City's existing 36-inch raw water mains. In event of an emergency, the Contractor may be required to delay the scheduled interconnections, and/or re-instate service immediately to existing water mains, in which case, the City will extend the corresponding substantial and final completion dates.

G. Applicable Law/Compliance

(1) Applicable Law

This Agreement shall be deemed to be a Virginia contract and shall be governed as to all matters of validity, interpretations, obligations, performance, or otherwise, exclusively by the laws of the Commonwealth of Virginia, and all questions arising with respect thereto shall be determined in accordance with such laws. Regardless of where actually delivered and accepted, this Agreement shall be deemed to have been delivered and accepted by the parties in the Commonwealth of Virginia.

(2) Compliance with all Laws

Contractor shall comply with all federal, state and local statutes, ordinances, and regulations, now in effect or hereafter adopted, in the performance of Work set forth herein. Contractor represents that it possesses all necessary licenses and permits required to conduct its business and will acquire any additional license and permits necessary for performance of this Agreement prior to the initiation of Work. [If the Contractor is a corporation] Contractor further expressly represents that it is a corporation in good standing in the Commonwealth of

Virginia and will remain in good standing throughout the term of the contract. Contractor shall at all times observe all health and safety measures and precautions necessary for the sanitary and safe performance of the contract Work.

(3) Venue

Any and all suits for any claims or for any breach or dispute arising out of these Contract Documents shall be maintained in the appropriate court of competent jurisdiction in the City of Norfolk.

(4) Environmental Considerations

Any cost or expense associated with environmentally related violations of the law, the creation or maintenance of a nuisance, or releases of hazardous substance, including but not limited to, the cost of any clean up activities, removals, remediation, responses, damages, fines, administrative or civil penalties or charges imposed on the Owner, whether because of actions or suits by any governmental or regulatory agency or by any private party, as a result of the release of any hazardous substances, or any noncompliance with or failure to meet any federal, state or local standards, requirements, laws, statutes, regulations or the law of nuisance by the Contractor (or its agents, officers, employees, subcontractors, consultants, sub-consultants, or any other persons, corporations, or legal entities employed, utilized, or retained by the Contractor) in the performance of this Agreement or related activities, shall be paid by the Contractor.

(5) Non-Discrimination/Drug-Free Workplace Provisions

(a) Employment discrimination by Contractor shall be prohibited. During the performance of this Agreement, Contractor agrees as follows:

- (i) Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification/consideration reasonably necessary to the normal operation of Contractor. Contractor will conform to the provisions of the Federal Civil Rights Act of 1964, as amended, as well as the Virginia Fair Employment Act of 1975, as amended, where applicable, the Virginians With Disabilities Act, the Americans With Disabilities Act, and the Code of Virginia § 2.2-4311. If the award is made to a faith-based organization, the organization shall not discriminate against any recipient of goods, services, or disbursements made pursuant to the Agreement on the basis of the recipient's religion, religious belief, refusal to participate in a religious practice, or on the basis of race, age, color, gender or national origin and shall be subject to the same rules as other organizations that contract with public bodies to account for the use of the funds provided; however, if the faith-based organization segregates public funds into separate accounts, only the accounts and programs funded with public funds shall be subject to audit by the public body. Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

- (ii) Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that Contractor is an equal opportunity employer.
 - (iii) Notices, advertisements and solicitations placed in accordance with federal law, rule or regulations shall be deemed sufficient for the purpose of meeting the requirements of this section.
 - (iv) Contractor will include the provisions of the foregoing subsections (i) and (ii), and (iii) in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.
- (b) During the performance of this Agreement, Contractor agrees as follows:
- (i) Contractor will provide a drug-free workplace for Contractor's employees.
 - (ii) Contractor will post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition.
 - (iii) Contractor will state in all solicitations or advertisements for employees placed by or on behalf of Contractor that Contractor maintains a drug-free workplace.
 - (iv) Contractor will include the provisions of the foregoing subsections (i), (ii) and (iii) in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.
 - (v) For the purposes of this section, "Drug-free workplace" means a site for the performance of work done in connection with a specific contract awarded to a Contractor, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession, or use of any controlled substance or marijuana during the performance of the contract."

(6) **COMPLIANCE WITH FEDERAL IMMIGRATION LAW**

At all times during which any term of this Agreement is in effect, the Contractor does not and shall not knowingly employ any unauthorized alien. For purposes of this section, an "unauthorized alien" shall mean any alien who is neither lawfully admitted for permanent residence in the United States nor authorized to be employed by either Title 8, section 1324a of the United States Code or the U.S. Attorney General.

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H. Liquidated Damages

The damage and loss to the Owner resulting from failure of the Contractor to complete the Work within the time specified in this Agreement, plus any extension of time granted, shall be stipulated in Section 108.X, and Section 102.III, Bid Form. Damage monies may be withheld on partial and final payment to the Contractor. (See Section 102.III Bid Form and Section 108.X for explanation and specified dollar amounts.) **Liquidated damages as stipulated in the Bid Form, in the amount of \$1,000.00 per Calendar Day for failure to meet the substantial completion date and \$500.00 per Calendar Day for failure to meet the final completion date will be assessed by the Owner for failure of the Contractor to complete the Work on or before the Date of Substantial and Final Completion stated above or as may be modified by duly executed Change Orders. If Substantial completion has not been achieved by the scheduled Final completion date, the liquidated damages will run concurrently until substantial completion is achieved.**

I. Component Parts of the Contract

This Agreement includes all completed components of the Bid and Contract Documents as defined in Section 101 of the HRPDC *Regional Construction Standards* (Latest Edition indicated in the Invitation For Bids), as revised for this Project all of which are incorporated herein by reference.

J. Binding

This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

K. Changes to the Agreement

No provision of this Agreement shall be changed, amended, modified, waived, or discharged except as agreed to in writing by the Owner and the Contractor.

L. EMERGENCY SERVICES

Under emergency conditions the City reserves the right to utilize the Contractor for related services, as deemed appropriate to help resolve the emergency. During the contract period, if an emergency situation (natural or man-made) occurs, the Contractor agrees to dedicate the personnel allocated to this project to assist the Owner during the recovery period. The Owner shall direct this work in writing and costs will be paid according to the rates for Additional Services. Hourly rates for these services will be at the rates agreed upon under this agreement.

M. COMPLIANCE WITH STATE LAW – AUTHORIZATION TO TRANSACT BUSINESS IN THE COMMONWEALTH

Contractor hereby represents that it is organized as a stock or non-stock corporation, limited liability company, business trust, or limited partnership or registered as a registered limited liability partnership and is authorized to transact business in the Commonwealth as a domestic or foreign business entity if so required by Title 13.1 or Title 50 or as otherwise required by law.

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IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as of the day and first above written in (_____) counterparts each of which shall for all purposes be deemed an original.

OWNER

CONTRACTOR

City of Norfolk
Owner

Contractor

By: _____
City Manager

By: _____

Title: _____

Date: _____

Attest: _____

Address: _____

Attest: _____
City Clerk

APPROVED AS TO CONTENT:

Contractor's Registration No.: _____

(If Contractor is a corporation or an unincorporated organization, attach evidence of authority to sign)

Director of Utilities

[Corporate Seal]

APPROVED AS TO FORM:

Deputy City Attorney

I hereby certify that the money required for this contract (agreement, obligation or expenditure) is in the City Treasury to the credit of the fund from which it is to be drawn, and not appropriated for any other purpose.

Account No:

Amount:

Contract No:

Vendor Code:

Director of Finance



IV. PERFORMANCE BOND

Bond No. _____
Amount: \$ _____

KNOW ALL PERSONS BY THESE PRESENTS, that _____ of _____, hereinafter called the Contractor and _____ a corporation duly organized and existing under and by virtue of the laws of the State of _____, hereinafter called the Surety, and authorized to transact business within the Commonwealth of Virginia as the Surety, are held and firmly bound unto _____ as Owner, in the sum of _____ dollars (\$ _____), lawful money of the United States of America, for payment of which, well and truly be made to the Owner, the Contractor and the Surety bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the Contractor has executed and entered into a certain Agreement, hereto attached, with the Owner dated _____, 20____, for _____

NOW THEREFORE, if the Contractor, and its successors and assigns, shall at all times duly, promptly, and faithfully perform the Work and any alteration in or addition to the obligations of the Contractor arising thereunder, including the matter of infringement, if any, of patents or other proprietary rights, and shall assure all guarantees against defective workmanship and materials, including the guarantee period following final completion by the Contractor and final acceptance by the Owner and comply with all the covenants therein contained in the Specifications, Drawings, and other Contract Documents required to be performed by the Contractor, in the manner and within the times provided in the Agreement, and shall fully indemnify and save harmless the Owner from all costs and damage which it may suffer by reason or failure to do so, and shall fully reimburse and repay it all outlay and expenses which it may incur in making good any default, and reasonable counsel fees incurred in the prosecution of or defense of any action arising out of or in connection with any such default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that the Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract Documents or to the Work to be performed thereunder, or payment thereunder before the time required therein, or waiver of any provision thereof, or assignment, subletting or transfer thereof or any part thereof, shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration, addition to the terms of the Contract Documents or any such payment, waiver, assignment, subcontract or transfer.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

Whenever Contractor shall be declared by Owner to be in default under the Contract, the Owner having performed Owner's obligations thereunder, the Owner shall have the right, at its option, to require the Surety to promptly proceed to remedy the default within 30 days of notice by proceeding or procuring others to proceed with completing the Agreement with its terms and conditions; and all reserves, deferred payments,



and other funds provided by the Agreement to be paid to Contractor shall be paid to Surety at the same times and under the same conditions as by the terms of that Agreement such fund would have been paid to Contractor had the Agreement been performed by Contractor; and Surety shall be entitled to such funds in preference to any assignee of Principal of any adverse claimant. Notwithstanding the above, the Owner shall have the right, with the approval of the Surety which shall not be unreasonably withheld, to take over and assume completion of the Agreement and be promptly paid in cash by the Surety for the cost of such completion less the balance of the Contract price.

IN WITNESS WHEREOF, all above parties bounded together have executed this instrument this ____ day of _____, 20____, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACTOR

By: _____ (Seal)
Name: _____
Title: _____

Attest

SURETY

By: _____ (Seal)

Attest

APPROVED AS TO FORM: _____, 20____

DEPUTY CITY ATTORNEY

NOTE: Date of Bond shall not be prior to the date of the Agreement. If the Contractor is a partnership, all partners shall execute the Bond.

IMPORTANT: The Surety named on this Bond shall be one who is licensed to conduct business in the Commonwealth of Virginia, and named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All Bonds signed by an agent shall be accompanied by a certified copy of the authority to act for the Surety at the time of signing of this Bond.

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V. PAYMENT BOND

Bond No. _____
Amount: \$ _____

KNOW ALL PERSONS BY THESE PRESENTS, that _____ of _____ hereinafter called the Contractor and _____ a corporation duly organized and existing under and by virtue of the laws of the State _____, hereinafter called the Surety, and authorized to transact business within the Commonwealth of Virginia as the Surety, are held and firmly bound unto _____ as Owner, in the sum of _____ dollars (\$ _____), lawful money of the United States of America, for payment of which, well and truly be made to the Owner, the Contractor and the Surety bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the Contractor has executed and entered into a certain Agreement, hereto attached, with the Owner dated _____, 20____, for _____

NOW THEREFORE, if the Contractor shall promptly make payments to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the Work provided for in the Agreement, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, repairs on machinery, equipment, and tools consumed, used or rented in connection with the construction of the Work, and all insurance premiums on the Work, and for all labor performed in the Work, whether by Subcontractor or otherwise, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract Documents or to the Work to be performed thereunder, shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract Documents.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

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IN WITNESS WHEREOF, all above parties bounded together have executed this instrument this ____ day of _____, 20____, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACTOR

By: _____(Seal)

Name: _____

Title: _____

Attest

SURETY

By: _____(Seal)

Attest

APPROVED AS TO FORM: _____, 20_____

DEPUTY CITY ATTORNEY

NOTE: Date of Bond shall not be prior to the date of the Agreement. If the Contractor is a partnership, all partners shall execute the Bond.

IMPORTANT: The Surety named on this Bond shall be one who is licensed to conduct business in the Commonwealth of Virginia, and named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All Bonds signed by an agent shall be accompanied by a certified copy of the authority to act for the Surety at the time of signing of this Bond.

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VI. IRREVOCABLE LETTER OF CREDIT

IRREVOCABLE LETTER OF CREDIT NO. _____

WORDS IN PARENTHESES ARE INSTRUCTIONS. ANY VARIATIONS WILL BE REJECTED.

BANK LETTERHEAD

Marcus D. Jones, City Manager
City of Norfolk
810 Union Street
1101 City Hall Building
Norfolk, VA 23510

DATE

To Whom It May Concern:

We hereby authorize the City Manager, or agent, to draw on us for the account of **(Developer's Name and Address)** up to an aggregate amount of U.S. Dollars **(Amount)** available by your drafts at sight accompanied by certification of Director, Department of Public Works, that the developer failed to complete installation or performance in accordance with a plan known as **(Plan Name and Number)** or otherwise failed to perform in accordance with an agreement dated _____ between **(Developer's Name)** and the City. This Letter of Credit is irrevocable and unconditional.

We hereby further agree that:

- (a) Drafts drawn under and in compliance with the terms of this Letter of Credit will be duly honored if presented at our office on or before **(This Date Must Be At Least Six Months After Agreement Expiration Date)**.
- (b) Funds available under this Letter of Credit shall be paid by us in such amounts and at such times as determined by the Director, Department of Public Works, or the City Manager, in their sole discretion, provided that the amount drawn shall not exceed the aggregate amount specified herein. Checks will be made payable to "Treasurer, City of Norfolk" and directed to the attention of the City Manager.
- (c) We shall have no right, duty, obligation or responsibility to evaluate the performance or non-performance of the underlying contract between our customer and the beneficiary of this Letter of Credit.
- (d) We hereby agree that no change, extension of time, alteration or addition to work to be performed or to the plans and specifications relating to the same, shall in any way affect our obligations under this Letter of Credit and we hereby waive notice of any such change, extension of time, alteration, or addition, on the understanding that no such change, extension of time, alteration, or addition shall increase the amount of our obligation under this Letter of Credit.
- (e) It is a condition of this Letter of Credit that it will be automatically extended for successive six (6) month periods of time unless thirty (30) days prior to an expiration date we notify the Director,

Department of Public Works, in writing by registered mail, that we elect not to renew this Letter of Credit for such additional period.

- (f) Upon receipt by you of such notice of non-renewal or in the event of a default, you may draw hereunder by means of your drafts on us, at sight accompanied by your written certification that you have not released liability under the aforesaid agreement or undertaking and the proceeds of your draft will be used by you to meet eventual payments under your agreement or until your undertaking is satisfied. You will refund to us the amount paid, less any amounts which may have been paid by you in the meantime under this agreement or undertaking. A default shall be deemed to have occurred on the part of the Developer whenever, in the sole judgment of the City Manager or the Director, Department of Public Works, the Developer is not diligently and satisfactorily completing the improvements for which the Letter of Credit has been given as security or at the date the underlying agreement, or any extension thereof, expires.
- (g) If the issuer of this Letter of Credit becomes critically undercapitalized, as defined in the Code of Federal Regulations, or insolvent, as defined in any applicable federal or state statute or regulation, the City shall be immediately entitled to draw on this Letter of Credit. In such event, you may draw on this Letter of Credit by means of your drafts on us, at sight accompanied by certification of the City Manager or the Director, Department of Public Works, that the issuer of this Letter of Credit has become critically undercapitalized, as defined in the Code of Federal Regulations, or insolvent, as defined in any applicable federal or state statute or regulation. The refund provisions of paragraph (f) above would also apply to a draft under this paragraph.
- (h) Except so far as otherwise expressly stated, this Letter of Credit is subject to the Uniform Customs and Practice for Documentary Credits, International Chamber of Commerce in effect on the date of issuance. The amount of any draft drawn hereunder must be endorsed on the reserve side hereof. All drafts must be marked "Drawn under **(Bank's Name)** Letter of Credit **(No. and Date as above)**".

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- (i) Approval of this Letter of Credit by the City shall be deemed acceptance without further notice to the bank and/or the Developer.

(Bank Name)

By: _____
(Signature)

(Print or type name and title)

ACKNOWLEDGMENT (Notarization)

STATE OF _____:

COUNTY/CITY OF _____:

I, _____, a Notary Public in and for the State and County/City aforesaid, do hereby certify that _____ whose name is signed to the foregoing, this day personally appeared before me in my State and County/City aforesaid and acknowledged the same.

Given under my hand this _____ day of _____, 20_____.

Notary Public

My Commission Expires: _____

CITY OF NORFOLK, VIRGINIA

APPROVED AS TO FORM AND CORRECTNESS:

City Attorney's Office

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assign, pledge, discount, sell or otherwise transfer or dispose of his interest in the escrow account or any part thereof, except to the Surety.

IV. Upon receipt of checks or warrants drawn by the City and made payable to it as escrow agent, the Bank shall promptly notify the Contractor, negotiate the same and deposit or invest and reinvest the proceeds in approved securities in accordance with the written instructions of the contractor. In no event shall the Bank invest the escrowed funds in any security not approved.

V. The following securities, and none other, are approved securities for all purposes of this Agreement:

- (1) United States Treasury bonds, United States Treasury Notes, United States Treasury Certificates of Indebtedness or United States Treasury Bills,
- (2) Bonds, notes and other evidences of indebtedness unconditionally guaranteed as to the payment of principal and interest by the United States,
- (3) Bonds or notes of the Commonwealth of Virginia,
- (4) Bonds of any political subdivision of the Commonwealth of the Bank or deposit by the Contractor, a Standard and Poor's or Moody's Investors Service rating of at least "A", and
- (5) Certificates of deposit issued by commercial Banks located within the Commonwealth, including , but not limited to, those insured by the Bank and its affiliates,
- (6) Any bonds, notes, or other evidences of indebtedness listed in Sections (1) through (3) may be purchased pursuant to a repurchase agreement with a bank, within or without the Commonwealth of Virginia having a combined capital, surplus and undivided profit of not less than \$25,000,000, provided the obligation of the Bank to repurchase is within the time limitations established for investments as set forth herein. The repurchase agreement shall be considered a purchase of such securities even if title, and/or possession of such securities is not transferred to the Escrow Agent, so long as the repurchase obligation of the Bank is collateralized by the securities themselves, and the securities have on the date of the repurchase agreement a fair market value equal to at least 100% of the amount of the repurchase obligation of the Bank, and the securities are held by a third party, and segregated from other securities owned by the Bank.

No security is approved hereunder which matures more than five years after the date of its purchase by the Bank or deposit by the Contractor.

VI. The Contractor may from time to time withdraw the whole or any portion of the escrowed funds by depositing with the Bank approved securities in an amount equal to, or in excess of, the amount so withdrawn. Any securities so deposited or withdrawn shall be valued at such time of deposit or withdrawal at the lower or par or market value, the latter as determined by the Bank. Any securities so deposited shall thereupon become a part of the escrowed fund.

Upon receipt of a direction signed by the City Manager or Assistant City Manager, the Bank shall pay the principal of the fund, or any specified amount thereof, to the City of Norfolk for the account of the project. Such payment shall be made in cash as soon as is practicable after receipt of the direction.

Upon receipt of a direction signed by the City Manager or Assistant City Manager or Director of Public Works or Director of Utilities, the Bank shall pay and deliver the principal of the fund, or any specified amount thereof, to the Contractor, in cash or in kind, as may be specified by the Contractor. Such payment and delivery shall be made as soon as is practicable after receipt of the direction.

VII. For its services hereunder the Bank shall be entitled to a reasonable fee in accordance with its published schedule of fees or as may be agreed upon by the Bank and the Contractor. Such fee and any other costs of administration of the Agreement shall be paid from the income earned upon the escrowed fund and, if such income is not sufficient to pay the same, by the Contractor.

VIII. The net income earned and received upon the principal of the escrowed fund shall be paid over to the Contractor in quarterly or more frequent installments. Until so paid or applied to pay the Bank's fee or any other costs of administration such income shall be deemed a part of the principal of the fund.

IX. The Surety undertakes no obligation hereby but joins in this Agreement for the Sole purpose of acknowledging that its obligations as surety for the Contractor's performance of the contract are not affected hereby.

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WITNESS the following signatures, all as of the day and year first above written.

CITY OF NORFOLK, VIRGINIA

By: _____
City Manager or Assistant City Manager

ATTEST:

City Clerk

Contractor

APPROVED AS TO FORM AND CORRECTNESS:

By: _____
Officer, Partner or Owner

Deputy City Attorney

(Seal)

Name: _____

Title: _____

Bank

By: _____
Signature

Name: _____

Title: _____

Surety

By: _____
Signature

Name: _____

Title: _____

Ref: DOT FORM C-8
REV 1/1/87

MGR/gt 12/21/89

¹ If executed by Attorney-in-Fact, fully-executed Power of Attorney is attached. The power is recorded in Norfolk Circuit Court in Deed Book No. _____, Page _____.



VIII. NOTICE TO PROCEED

TO: _____

DATE: _____
PROJECT: _____

You are hereby notified to commence Work in accordance with the Agreement dated _____, 20 __, on or before _____, 20 __, and you are to substantially complete the Work within _____ Days thereafter and reach Final Completion of the Work within _____ Days thereafter. The date of Final Completion of all Work is therefore _____, 20 __.

Liquidated damages as stipulated in the Bid Form, in the amount of **\$1000.00 per Calendar Day for failure to meet the substantial completion date and \$500.00 per Calendar Day for failure to meet the final completion date** will be assessed by the Owner for failure of the Contractor to complete the Work on or before the Date of **Substantial and Final Completion** stated above or as may be modified by duly executed Change Orders. **If Substantial completion has not been achieved by the scheduled Final completion date, the liquidated damages will run concurrently until substantial completion is achieved.**

OWNER: City of Norfolk
BY: _____
TITLE: _____

ACCEPTANCE OF NOTICE:

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by:

this the _____ day of _____, 20 __

CONTRACTOR: _____
BY: _____
TITLE: _____

End of Section



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SECTION 104

SCOPE OF WORK

I. INTENT OF AGREEMENT

- 1.1. The intent of the Agreement is to provide for completion of the Work specified therein.
- 1.2. If, during the performance of the Work, the Contractor finds a conflict, error or discrepancy in the Contract Documents, the Contractor shall so report to the Owner in writing at once and before proceeding with the Work affected thereby, except in the case of emergency or public safety, shall obtain a written interpretation or clarification from the Owner however, the Contractor shall not be liable to the Owner for failure to report any conflict, error or discrepancy in the Contract Documents unless the Contractor has actual knowledge thereof or should reasonably have known thereof.

II. AMENDING AND SUPPLEMENTING CONTRACT DOCUMENTS

- 2.1. The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof by a Change or Field Order pursuant to Section 109 II.

III. EXPLORATIONS AND REPORTS

- 3.1. Reference is made to the Special Provisions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by the Owner in preparation of the Contract Documents.
- 3.2. The Contractor shall visit the site of the proposed Work and make such explorations as the Contractor determines to be necessary.

IV. UNDERGROUND FACILITIES

- 4.1. The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to the Owner or Engineer by the owners of such Underground Facilities or by others.
- 4.2. The Owner and Engineer shall not be responsible for the accuracy or completeness of any such information and data. The Contractor shall have full responsibility for reviewing and checking all such information and data, for locating all Underground Facilities shown or indicated in the Contract Documents, for coordination of the Work with the owners' of such Underground Facilities during construction, for the safety and protection of said facilities, and repairing any damage thereto resulting from the Work, the cost of all of which will be considered as having been included in the Contract Base Bid.
- 4.3. If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents and which the Contractor could not reasonably have been expected to be aware of, the Contractor shall, promptly after becoming aware thereof and before performing any Work affected thereby, identify and immediately notify the owner of such Underground Facility and give written Notice thereof to that owner and to the Owner. The Owner will promptly review the Underground Facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the

Underground Facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time the Contractor shall be responsible for the safety and protection of any such Underground Facility which is in service or which is to be placed in service. The Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any Underground Facility in service or which is to be placed in service, which directly and unavoidably impacts the installation of the Work, that was not shown or indicated in the Contract Documents and which the Contractor could not reasonably have been expected to be aware of.

- 4.4. If the existence of an Underground Facility described above unavoidably impacts the installation of the Work, the Contractor shall, to the fullest extent possible, continue the Work on other portions of the site. All delays must be shown by the Contractor to be directly attributable to said unforeseen conditions and limited to the time actually occasioned by such unforeseen conditions, and that the Contractor has prosecuted the other portions of the Work to the fullest extent possible.
- 4.5. The Contractor shall comply with the Underground Utility Damage Prevention Act, Section 56-265.14 through 56-265.32, Code of Virginia of 1950, as enacted and amended, and shall be responsible for notifying the owners of utilities and requesting the locating and marking of all underground facilities before beginning any excavation.
- 4.6. The Contractor should be aware that in some instances buried cables, gas lines, sewer lines, and water lines 2-inches and smaller in diameter may have to be excavated by hand and slightly relocated to facilitate construction of the Work under this Agreement. This shall be considered incidental to the Work, and the Contractor will not be eligible for additional compensation.
- 4.7. At points where the Contractor's operations are adjacent to the properties of any utility, including railroads, and damage to which might result in considerable expense, loss, or inconvenience, Work shall not commence until arrangements necessary for the protection thereof have been completed.
- 4.8. The Contractor shall cooperate with owners of utility lines so that removal and adjustment operations may progress in a reasonable manner, duplication of adjustment work may be reduced to a minimum, and services rendered by those parties will not be unnecessarily interrupted.
- 4.9. If any utility service is interrupted as a result of accidental breakage or of being exposed or unsupported, the Contractor shall promptly notify the proper authority and shall cooperate with the authority in the restoration of service. If utility service is interrupted, repair work shall be continuous until service is restored. The Contractor shall be responsible for any damage to utilities that are attributable to his neglect or methods of performing the Work.

V. SUBSURFACE CONDITIONS

- 5.1. The Contractor shall promptly, and if possible, before such conditions are disturbed, except in the event of an emergency, notify the Owner by written Notice of:
 - A. subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents; or
 - B. unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract Documents.

- 5.2. The Owner shall promptly investigate the conditions, and if it is confirmed that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the Work, an equitable adjustment shall be made and the Agreement shall be modified by a Change Order. Any claim of the Contractor for adjustment hereunder shall not be allowed unless the Contractor has given the required written Notice; provided that the Owner may, if the facts so justify, consider and adjust any such claims asserted before the date of final payment.
- 5.3 All required written Notices shall be submitted to the Owner within 20 Days after occurrence of the event giving rise to such claim, or within 20 Days after the claimant recognizes the condition, whichever is later.

VI. SITE SECURITY

- 6.1. The Contractor shall be responsible for the security and safety of all project facilities including, but not limited to, all equipment, materials, site structures, and construction thereon. All security measures deemed necessary by the Contractor to comply with this requirement shall be at the Contractor's expense at no additional cost to the Owner. The Contractor shall be responsible for all site security until final acceptance of the Work by the Owner.

VII. DOCUMENTATION OF SITE CONDITIONS

- A. Contractor shall document, through digital photographs and digital video recording, the existing condition of the project site, surrounding areas and access routes prior to construction activities beginning and provide that documentation to the Owner and Engineer prior to commencing construction.**
- B. Photographs:**
- 1. Take digital preconstruction photographs of the project site. As a minimum, take photographs at each intersection, all driveways, and a minimum of two pictures at the front of each property. Digital photos are to be labeled with time and date taken.**
 - 2. Furnish CD or DVD copy of digital photographs to the Owner and Engineer.**
- C. Video Recording:**
- 1. The preconstruction site survey video shall clearly document the existing site and structure conditions within and adjacent to the work limits, easement areas, staging areas and access routes for this Contract. The video shall be in high definition format. The cost of the video recording survey shall be at the Contractor's expense. Video of all pavement and sidewalk, with points of reference, shall be provided that clearly shows the condition with specific emphasis on any defects.**
 - 2. All inspection videos shall be submitted in MPEG file format (.mpg) and saved on CDs, DVDs, or external hard drives for submittal.**

VIII. CLEAN-UP, DISPOSAL AND RESTORATION

- 7.1. The Contractor shall maintain the site of the project in an orderly and clean condition and shall at intervals of no more than three (3) working days and at its expense, remove and legally dispose of accumulations of rubbish or refuse materials, surplus concrete, mortar and excavated materials not required or suitable for backfill from public and private property and rights-of-way. Washings from concrete mixers or mixing boxes shall not be deposited directly or indirectly in the drainage or sewer system or on paved streets. The Contractor shall keep the site, inclusive of vehicular and pedestrian traffic routes through the site, free of dirt and dust by periodic blading, power brooming, watering or other approved means. Road surfaces adjacent to the work area shall be cleaned of soil with mechanical brooms or other approved methods at the end of each working day. Road shoulders and

driveways shall be stabilized so as to allow traffic flow (including mail and paper delivery vehicles, school buses and emergency vehicles) by the end of each working day.

- 7.2. The Contractor shall confine all equipment, the storage of materials and equipment, and the operations of workmen to areas permitted by law, ordinances, permits, or the requirements of the Contract Documents, and shall not unreasonably encumber the premises with materials or equipment.
- 7.3. The Contractor shall not load nor permit any part of any structure to be loaded with weights that will endanger the structure, nor shall any part of the work be subjected to stresses or pressures that will endanger it.
- 7.4. Upon completion and before final acceptance of the Work performed under the Agreement, the Contractor shall remove and legally dispose of all rubbish, surplus or discarded materials, false work, forms, temporary structures, field offices, signs, temporary erosion and siltation control measures, and equipment and machinery, and shall leave the site and ground occupied in connection with the performance of the Work in the conditions existing before the Work was started, to the satisfaction of the Owner.
- 7.5. All waste materials, including but not limited to excavated materials, demolished pavement, arboreal (landscaping) waste and other debris, that are not suitable for Project related purposes (e.g., backfill) or are surplus to the needs of the Project, both as determined by the Owner, shall become the property of the Contractor. The Contractor shall dispose of all such material in accordance with his accepted Disposal Plan, as specified below, at no additional cost to the Owner.
 - A. The Contractor shall submit a Disposal Plan for review and acceptance by the Owner prior to performing any Work that might generate waste materials. The plan shall include a complete description of the materials that are expected to be encountered and their proposed disposal site(s). The Contractor may change his Disposal Plan only by written notice to the Owner. The acceptance of a plan and/or any related notice to the Owner must be evidenced by a written response from the Owner.
 - B. The Contractor shall insure that all permits related to his disposal operations have been obtained, and the Contractor shall comply with all requirements of those permits. The Contractor shall show evidence that all required permits have been obtained for all disposal sites by submitting a copy of all such permits to the Owner as part of the Contractor's Disposal Plan.

End of Section

SECTION 105

CONTROL OF WORK

I. REUSE OF CONTRACT DOCUMENTS

- 1.1. Neither the Contractor nor any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with the Owner shall have or acquire any title to or ownership rights in any of the Contract Documents (or copies thereof) prepared by or bearing the seal of the Engineer; and, they shall not reuse any of the Contract Documents on extensions of the Project or any other project without written consent of the Owner and Engineer and specific written verification by the Owner.

II. COPIES OF CONTRACT DOCUMENTS

- 2.1. The Owner will furnish to the Contractor up to **ten (10)** copies of the Contract Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

III. CONTRACT DOCUMENTS

- 3.1. The Contract Documents will govern the Work set forth therein.
- 3.2. In cases of conflicts, Special Provisions shall govern over the *Regional Construction Standards*; Specifications shall govern over Drawings; figure dimensions shall govern over scaled dimensions; and, detailed Drawings shall govern over general Drawings; unless, the interpretation would result in a violation of any law or regulation applicable to the performance of the Work.
- 3.3. The Contractor shall, upon discovering any error, omission, or discrepancy in the Contract Documents, immediately notify the Owner.

IV. SHOP DRAWINGS AND SUBMITTALS

- 4.1. The Contractor shall compile a complete and comprehensive schedule of all the submittals anticipated to be made during the progress of the Work. The schedule shall include a list of each type of item for which the Contractor's drawings, Shop Drawings, material affidavits, material samples, guarantees, or other types of submittals are required. **The Contractor shall submit a complete and copy of the Approved Products List for all standard sewer, water, and force-main items. All items used shall have been manufactured within two (2) years of the bid date of the project.**
- 4.2. Prior to each submittal, the Contractor shall carefully review and coordinate all aspects of each item or sample submitted with any other item or sample being submitted and verify that each item and sample adheres in all respects with the requirements of the Contract Documents.
- 4.3. The Contractor shall certify that all materials used in the Work are in complete compliance with all specified provisions. Certification shall not be construed as relieving the Contractor from its responsibility of furnishing satisfactory materials. At the time of each submission, the Contractor shall in writing call the Owner's attention to any deviations that the Shop Drawings or samples may have from the requirements of the Contract Documents.

- 4.4. The Contractor shall submit four (4) copies, plus the number of copies desired to be returned, of Shop Drawings or submittals that are required by Section 105 or the Special Provisions **for a total of not more than ten (10)**. Each submission shall be accompanied by letter of transmittal in duplicate, listing the contents of the submission and identifying each item by reference to specification section or Drawing. The data shown on the Shop Drawings shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to show the Owner the materials and equipment the Contractor proposes to provide.
- 4.5. The Contractor shall also submit samples to the Owner for review and approval in accordance with the accepted schedule of submittals. Each sample shall be identified clearly as to material, supplier, pertinent data such as catalog numbers and the use for which intended and otherwise as the Owner may require for review. The review of a separate item or sample will not indicate approval of any assembly in which the separate item or sample functions.
- 4.6. The Contractor is responsible for submitting all Shop Drawings and schedules in a timely manner to avoid delaying the Work. The Owner shall within 21 days after receipt, return Shop Drawings and schedules to the Contractor indicating approval or disapproval. **Shop Drawings will not be reviewed prior to issuance of the N.T.P.**
- 4.7. Review and/or approval of Shop Drawings will be for general conformance with the Contract Documents and shall not relieve the Contractor from the responsibility of furnishing materials and equipment of proper dimension, size, quality, quantity, and all performance characteristics to efficiently perform the requirements and intent of the Contract Documents. Approval shall not be construed as permitting any departure from the Project requirements, authorization of any increase in price, or approval of departures from additional details or instructions previously furnished by the Owner.
- 4.8. Before submitting each Shop Drawing or sample, the Contractor shall have determined and verified:
 - A. All field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar information with respect thereto;
 - B. All materials with respect to the intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the work; and
 - C. All information relative to the Contractor's sole responsibility in respect of means, methods, techniques, sequences and procedures of construction and safety precautions and progress incident thereto.
- 4.9. Each Shop Drawing and sample submission shall bear a stamp or specific written indication that the Contractor has satisfied Contractor's obligation under the Contract Documents with respect to the Contractor's review and approval of that submission. The Contractor's Shop Drawing stamp shall be as follows (or as otherwise approved by the Owner and Engineer):

(Owner's Name)
 (Project Name)

Shop Drawing No.: _____

Specification Section: _____

With respect to this Shop Drawing or Sample, I have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar data with respect thereto and reviewed or coordinated this Shop Drawing or Sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents.

_____ *No variation from Contract Documents*

_____ *Variation from Contract Documents as shown*

(Contractor's Name and Address)

By: _____

Date: _____

- 4.10. The Engineer will review and approve or disapprove or return as incomplete Shop Drawings and samples in accordance with the schedule of submittals submissions accepted by the Engineer. The Engineer's review and approval or disapproval will not extend to means, methods, techniques, sequences or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The Contractor shall make corrections required by the Engineer, and shall return the requested number of copies of Shop Drawings and samples for review and approval. The Contractor shall direct specific attention in writing to revisions other than the corrections called for by the Engineer on previous submittals. Upon approval, two marked copies will be returned to the Contractor.
- 4.11. No progress payments will be made to the Contractor until the schedules are submitted to and acceptable to the Engineer. The progress schedule shall be acceptable to the Engineer as being the Contractor's schedule for the orderly progression of the Work to completion within any specified Contract Times, but such acceptance will neither impose on the Engineer responsibility for the sequencing, scheduling or progress of the Work nor interfere with or relieve the Contractor from the Contractor's full responsibility therefor.
- 4.12. The Engineer will record time required by the Engineer or Engineer's consultants for excessive submittal review occasioned by the Contractor's re-submission, in excess of one re-submission of a required submittal, caused by unverified, unchecked or un-reviewed, incomplete, inaccurate or erroneous, or nonconforming submittals. The Engineer's costs will be an estimated average billing rate for labor plus related expenses.

- 4.13. Within ten (10) days after the Effective Date of the Agreement, the Contractor shall submit to the Engineer for approval a schedule listing the manufacturer of the items of equipment and materials proposed for the construction. Following approval of the schedule, no changes in material or equipment from those listed will be allowed except in unusual or extenuating circumstances. When such circumstances arise, the Contractor shall request, in writing, the Owner's approval of the proposed change, stating the circumstances necessitating such a change. The intent of this schedule is to name the manufacturers of material specified by a product standard and to designate which manufacturer will be used when more than one has been named for an item. The schedule shall not be interpreted as allowing any change from base Bid items or those substitute items offered with the Bid and accepted in the Agreement.

V. RECORD DRAWINGS

5.1. The Contractor shall keep one record copy of all Special Provisions, Specifications, Drawings, Addenda, Written Amendments, Change Orders, Shop Drawings, Owner-approved submittals, and samples at the site in good order and annotated to show all changes made during the construction process. These documents shall be available to the Owner for examination and shall be submitted to the Owner upon completion of the Work. As-built information (including dimensions, materials, existing utilities) shall also be included on the Drawings. Progress payments may be withheld for failure to keep neat, accurate and complete record drawings. **Record Drawings shall be submitted with monthly invoices.**

5.2. The Contractor shall include any field changes, deviations from the Drawings due both to field conditions and Change Orders.

5.3. Record information for projects shall include the following as a minimum:

- A. Size, horizontal and vertical location of all existing utilities uncovered during the course of the work. This shall include telephone cables and conduits, TV cables and conduits, electrical cables and conduits, gas lines, water line, sewer force mains, sanitary sewers, storm sewers and the like.
- B. Horizontal and vertical location of the water, force main, sanitary and storm sewer installed at every 100-foot station, at interconnections, and at fittings, tees, bends and offsets. The frequency and location of survey shots will match the proposed grade elevations shown on the Drawings.
- C. Location of lines plugged or capped, blowoffs, and air vents.
- D. Location of all restraining devices used; for example, thrust blocks, retainer glands, tie rods, etc.
- E. Location of all valves, ends of all lines and other fittings shall be accurately located by triangulation from two permanent structures, which will be visible on the ground surface.
- F. Location and size of all taps and service line connections made, including corporation stops (if any) used for testing purposes.
- G. Size (if greater than 3/4"), material, depth and location of both ends of the water service lines are required.

- H. Rim elevations of manholes and invert elevations of pipes entering and exiting the manhole.
 - I. Size, material, depth and location of sewer laterals including:
 - 1. Measurements taken from the nearest downstream manhole, then measure over perpendicular from that point on the main to the end of the lateral. All measurements are taken from the center of the manhole cover.
 - 2. If lateral comes out of a manhole in a cul-de-sac; triangulation from that manhole will be required.
 - 3. Measured depth from the finished grade at the end of the lateral.
 - J. Information required for public storm drain systems:
 - 1. Size, material and location of all storm sewer lines.
 - 2. Elevations shall be provided for all ditch, pipe and structure inverts and rims.
- 5.4 The Record Drawings shall include the following minimum accuracy for survey measurements and field measurements.
- A. Horizontal accuracy:
 - 1. Both surface and subsurface gravity sanitary sewer systems shall be measured in a survey to +/- 1.0 foot at the structure location.
 - 2. Both surface and subsurface pressure systems shall be measured in a survey to +/- 1.0 foot at the structure location.
 - 3. Curb/curb and gutter shall be measured in a survey to +/- 1.0 foot at high points, low points, curb returns, and various other positions following good engineering, construction and surveying practices.
 - 4. Storm Water Management Facilities (SWMF) shall be measured in a survey to +/- 1.0 foot, including the top of bank, bottom of bank, edge of water, pipes, structures, and setback distances to property lines and/or right-of-way lines and any unusual feature of each SWMF.
 - 5. Utility system components including, but not limited to, fire hydrants, meter vaults, meter boxes, water services, corporation stops, fittings, thrust restraint, laterals, cleanouts, valves, blow off assemblies, air vent assemblies, water sampling stations, etc. shall be measured in a survey to +/- 1.0 foot.
 - 6. Project landscaping shall be measured in a survey to +/- 1.0 foot. Only large significant features, such as trees, will be surveyed. The species and caliper (size) shall be noted.
 - 7. Street signs and light poles shall be measured in a survey to +/- 1.0 foot.

B. Vertical accuracy:

	Survey Accuracy	Field Measurement
Manhole Rim	+/- 0.01 ft.	
Manhole Invert	+/- 0.01 ft.	
Gravity Sewer Slope	+/- 0.02%	
Valve Depth	+/- 0.1 ft.	
Pressure/vacuum systems	+/-0.05 ft.	
SWMF	+/- 0.01 ft.	
Curb/curb and gutter	+/- 0.01 ft.	
Offset		+/- 1.0 ft.
Lateral Depth		+/- 0.25 ft.

VI. ACCESS TO PROJECT

6.1. The Owner, the Owner’s Representatives, the Engineer, testing agencies and governmental agencies with jurisdictional interests shall have access to the Project at all times for their observations, inspecting, and testing. The Contractor shall provide proper and safe conditions for such access.

VII. SURVEYS AND REFERENCE POINTS

7.1. The Owner shall furnish all necessary Drawings showing property lines and/or easements and the location of the Work. The Contractor shall provide a land surveyor licensed in the Commonwealth of Virginia to execute the Work in accordance with the Contract Documents and shall be responsible for the accuracy of this Work.

7.2. The Owner has established or will establish such general reference and control points and benchmarks on or about the Project site as will enable the Contractor to proceed with the Work. Prior to issuance of the Notice to Proceed, if the Contractor finds that any previously established reference points have been destroyed or misplaced, the Contractor shall promptly notify the Owner, and the Owner shall replace such general reference points and benchmarks at the Owner’s expense.

7.3. The Contractor shall protect and preserve the established control points, benchmarks and monuments and shall make no changes in locations without the written approval of the Owner. Any of these which may be lost or destroyed or which require shifting because of necessary changes in grades or locations shall, subject to prior approval of the Owner, be replaced and accurately located by the Contractor, at no expense to the Owner.

7.4. **The contractor shall be responsible for the layout of the proposed work in its entirety. The layout shall be performed by a Licensed Land Surveyor and based on NAVD 88 (92) Datum.**

VIII. WORKING HOURS

8.1 **Normal working hours shall be 7:30 a.m. to 4:30 p.m., Monday through Friday, except that work shall not start any earlier than one-half hour after sunrise or continue beyond one-half hour prior to sunset.** If the Contractor desires to perform Work outside the normal working hours, on Holidays, or on weekends, the Contractor shall request permission, **in writing**, 48-hours in advance to allow arrangements to be made. The Owner may refuse the Contractor permission to work outside the normal working hours **if the 48-hour notice is not given, or for other just cause.** The Contractor shall make reasonable efforts to avoid undue noise during the night and on weekends, including, but not limited to, fireproof covering necessary to dampen excessive noise from engines or

pumps which operate before 7:00 a.m. and after 9:00 p.m., if it is necessary to work at those times. **Weekend work will only be allowed on the first and third Saturdays of each calendar month, excluding holiday weekends. If a work Saturday falls on a holiday weekend, a makeup Saturday will be allowed on the following weekend. This requirement will be waived only if special circumstances warrant work on additional Saturdays for a particular project. This shall be at the sole discretion of the Department of Utilities. In the event of inclement weather on the first and third Saturdays of a particular month, makeup work on other Saturdays during the month will not be allowed**

HDD operations, which by their nature are generally executed non-stop, will not be subject to the foregoing “normal working hours” restrictions.

- 8.2. The Contractor shall designate a representative and furnish a telephone number at which the representative may be contacted at any time after working hours. This representative shall be empowered and authorized to provide such personnel and equipment as may be required to remedy emergency situations that may develop after normal working hours, or on weekends and holidays.
- 8.3. The Contractor shall receive approval of the Owner, in advance, of any work to be performed on Holidays. The Owner reserves the right to deny permission to work on Sundays and/or Holidays without cause.

Holidays are as listed below:

New Year’s Day	1	1 st day of January
Martin Luther King’s Birthday		3 rd Monday in January
President’s Day	3	1 st Monday in February
Memorial Day	Last	Monday in May
Independence Day	4	4 th day in July
Labor Day	1	1 st Monday in September
Veteran’s Day	11	11 th day of November
Thanksgiving Day	4	4 th Thursday in November
Day after Thanksgiving		Friday after 4 th Thursday in November
Christmas Eve		24 th day of December
Christmas Day		25 th day of December
Any Additional Day		As designated by Norfolk City Council

If January 1, July 4, Veterans Day or Christmas fall on a Sunday, the following Monday shall be considered the Holiday. If these dates fall on a Saturday, the previous Friday shall be considered the Holiday.

The Contractor’s attention is called to Section 109-1.5.C.1.d. regarding Owner compensation by the Contractor for overtime work performed outside normal working hours.

IX. PROJECT COORDINATION

9.1 Coordination with Owner

- A. The Contractor shall coordinate all construction activities with the Owner and shall obtain the Owner’s approval as to schedule of Work, permits, temporary work, and traffic control.



- B. Progress meetings shall be held monthly on a date to be set by the Owner. The Contractor shall be present at all progress meetings. If progress is not made as scheduled, or if the Owner desires to discuss revised progress schedules or the quality of workmanship or other aspects of the work, additional progress meetings can be required.
- C. The Owner may construct or reconstruct any utility service in the highway or street or grant a permit for the same at any time. The Contractor shall not be entitled to any damages occasioned thereby other than a consideration of an extension of time.
- D. When authorized by the Owner, the Contractor shall allow any person, firm, or corporation to make an opening within the limits of the Project upon presentation of a duly executed permit from the Owner. When directed by the Owner, the Contractor shall satisfactorily repair portions of the Work disturbed by the openings. The necessary Work will be paid for as extra Work in accordance with these specifications and shall be subject to the same conditions as the original Work performed.

9.2 Coordination with Utilities

- A. The Owner and Contractor agree that disruption to public services shall be avoided whenever possible and minimized when it is not avoidable. In cases where the disruption of existing facilities could adversely impact public service delivery, acceptable duration(s) and time(s) of the outages shall be coordinated between the Contractor and Owner, so as to explicitly minimize disruption to public service delivery.
- B. Before the initiation of any excavation, the Contractor shall locate all existing utilities, culverts, and other structures. Work shall be coordinated with affected utility companies. Prior to excavation, the Contractor shall contact MISS UTILITY at (800) 552-7001 and comply with all MISS UTILITY requirements.
- C. All existing utilities, both public and private (including sewer, gas, water, electrical services, etc.), shall be protected and their operation shall be maintained throughout the course of the Work. Any temporary shutdown of an existing service shall be arranged by the Contractor between the Contractor and the responsible agency. The Contractor shall assume full responsibility and defend and hold the Owner harmless from the result of any damage that may occur as a result of the Contractor's activities.
- D. If any utility service is interrupted as a result of accidental breakage or of being exposed or unsupported, the Contractor shall promptly notify the proper authority and shall cooperate with the authority in the restoration of service. If utility service is interrupted, repair work shall be continuous until service is restored. The Contractor shall be responsible for any damage to utilities that are attributable to his neglect or methods of performing the work.
- E. The Owner shall provide Utility companies with copies of the construction plans and or scope of work prior to construction. If requested by the Owner, the Contractor shall provide each affected utility company with a copy of the proposed schedule of progress prior to commencing work.
- F. Existing facilities (such as water and sewer valves) shall be operated only by the facility owner or under the direct supervision of the facility owner's personnel. The Contractor shall inform the owner at least 48-hours in advance of the need for the operation of existing facilities.

- G. At points where the Contractor's operations are adjacent to the properties of any utility, including railroads, and damage to which might result in considerable expense, loss, or inconvenience, Work shall not commence until arrangements necessary for the protection thereof have been completed.
- H. The Contractor shall cooperate with owners of utilities so that location, removal and adjustment operations may progress in a reasonable manner; duplication of adjustment work may be reduced to a minimum; and, services rendered by those parties will not be unnecessarily interrupted.
- I. The Contractor should be aware that in some instances buried cables, gas lines, water lines, etc., two inches and smaller in diameter may have to be excavated by hand and slightly relocated to facilitate construction of the Work under this contract. This shall be considered incidental to the Work, and shall be performed at no additional cost to the Owner.
- J. Should the location of any pipe or conduit greater than two-inches in diameter, pole, or other structures, above or below the ground be such that in the opinion of the Owner or his representative its removal, realignment, or change will be required due to work to be performed under this Contract, the removal, realignment, or change will be done as a Change Order, or will be done by the Owner of the obstructions, without cost to the Contractor. The Contractor shall maintain at his own expense the structures until such removal and before and after such realignment or change. The Contractor shall not be entitled to any claim for damages or extra compensation because of the presence of said structure, or because of any delay in the removal or relocation of the same.

X. SUPERVISION

- 10.1. The Contractor shall supervise and direct the Work, and shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor shall employ and maintain on the Project a qualified supervisor who shall have been designated in writing by the Contractor as the Contractor's representative at the site. The supervisor shall have full authority to act on behalf of the Contractor and all communications given to the supervisor shall be the same as if mailed to the business address of the Contractor. The supervisor or a designated representative shall be present on the site at all times as required to perform adequate supervision and coordination of the Work. The Contractor shall notify the Owner in writing prior to any change of supervisor, and receive the Owner's approval for the replacement. **The supervisor shall be assigned exclusively to this project.**
- 10.2. Upon notification to the Contractor, the Owner reserves the right to suspend the Work until such time as a supervisor satisfactory to the Owner is assigned to the project. Contract Time shall not be extended for such suspension nor shall the Contractor be entitled to any additional payment of any kind whatsoever as a result of such suspended work.
- 10.3. Any employee of the Contractor or Subcontractor who is deemed unsuitable may be removed from the job site by the Owner, provided that Written Notice and just cause is given to the Contractor. Said employee shall be removed immediately upon receipt of said Notice.

XI. UNCOVERING WORK

- 11.1. If any work has been covered or concealed without the Owner's approval prior to being covered or concealed, the Owner may request to see such work and it shall be exposed by the Contractor. The Contractor shall pay the cost of opening or uncovering and replacement and shall, in addition, at no cost to the Owner, make the necessary corrections to bring the work into accord with the Contract Documents.
- 11.2. Uncovering work shall be at the Contractor's expense unless the Contractor has given the Owner timely notice of the Contractor's intention to cover the same and the Owner has not acted with reasonable promptness in response to such notice.
- 11.3. If the Owner considers it necessary or advisable that covered Work previously approved be re-inspected or tested by others, the Contractor, at the Owner's request, shall uncover, expose or otherwise make available for observation, inspection or testing as the Owner may require, that portion of the Work in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such Work is defective, the Contractor shall bear all the expenses of such uncovering, exposure, observation inspection and testing and of satisfactory reconstruction. If, however, such Work is not found to be defective, the Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time or both directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate Change Order shall be issued.

XII. REMOVAL OF UNACCEPTABLE WORK

- 12.1. All Work that does not conform to the requirements of the Contract Documents shall be unacceptable.
- 12.2. The Contractor shall remove or correct all unacceptable and defective Work or materials. The replacement of Work and materials shall conform to the Contract Documents or be in a manner acceptable to the Owner. The Contractor shall bear all costs of such correction and/or removal and replacement.
- 12.3. Work done contrary to or regardless of the instructions of the Owner, Work done beyond the lines shown or as directed, except as herein provided, or any extra Work done without authority, will be considered unauthorized and will not be paid for under the provisions of the Agreement. Work so done may be ordered removed or replaced at no cost to the Owner.
- 12.4. If the Work is defective, or the Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, the Owner may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the Owner to stop the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any surety or other party. If the Contractor does not remedy, remove, or replace the rejected or condemned Work as instructed by the Owner within the time period stated by the Owner but in no case to exceed 30 Days after receiving written Notice, such remedy, removal, or replacement may be accomplished by the Owner at the Contractor's expense.

XIII. SUBSTANTIAL COMPLETION

- 13.1. Prior to Final Payment, but following completion of all required tests and inspections, the Contractor may request in writing that the Owner certify that the entire Project or any phase of the Project is Substantially Complete and request the Owner issue a Certificate of Substantial Completion. Within

fourteen (14) working days the Owner will conduct an inspection of the Project with the Contractor and either issue a Certificate of Substantial Completion or notify the Contractor in writing of the incomplete items. The Certificate and attachments shall include the following:

- A. A listing of responsibilities for the security, operation, safety, maintenance, utilities and insurance on the substantially completed portion;
- A. B. A tentative list of items to be completed or corrected prior to final payment; and,
- C. The maximum time for items to be completed or corrected prior to final payment.

13.2. The Owner shall have the right to exclude the Contractor from the Project or phase of the Work certified to be Substantially Complete; however, the Owner will allow the Contractor reasonable access to complete or correct the Work.

XIV. USE OF COMPLETED PORTIONS

14.1. The Owner shall have the right to take possession of and use any completed or partially completed portions of the Work, notwithstanding that the time for completing the entire Work or such portions may not have expired, but such taking possession and use shall not be deemed an acceptance of any Work not completed in accordance with the Contract Documents. If such prior use increases the cost of or delays the Work, the Contractor shall be entitled to such extra compensation or extension of time or both as the Owner and the Contractor may agree **by a Change Order.**

XV. FINAL INSPECTION

15.1. Upon receiving written Notice from the Contractor that the entire Work or an agreed upon portion is complete, the Owner will make a final inspection with the Contractor, and will notify the Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. The Contractor shall immediately take such measures as are necessary to complete such work or remedy such deficiencies.

15.2. This procedure shall be repeated until all items are corrected to the satisfaction of the Owner. Only written notification to the Contractor from the Owner will constitute final acceptance of any part of the Work under the Agreement.

XVI. CLAIMS

16.1. All claims, disputes, demands and other matters in question arising out of or relating to the Agreement or the Contract Documents, except for claims which have been waived by the Contractor's acceptance of final payment, will be addressed in accordance with the provisions of the Virginia Public Procurement Act and as stated here in; provided, however, the provisions of Section 2.2-4366 of that Act will not be applicable without the separate express written consent of the Owner.

16.2. Early or prior knowledge by the Owner of an existing or impending claim for damages could alter the plans, scheduling, or other action of the Owner or result in mitigation or elimination of the effect of the act objected to by the Contractor. Therefore, a written statement describing the act of omission or commission by the Owner or its agents that allegedly caused damage to the Contractor and the nature of the claimed damage shall be submitted to the Owner at the time of occurrence or beginning of the Work upon which the claim and subsequent action are based. If such damage is deemed certain in the opinion of the Contractor to result from his acting on an order from the Owner, he shall

immediately take written exception to the order. Submission of a notice of claim as specified shall be mandatory. Failure to submit such notice shall be a conclusive waiver to such claim for damages by the Contractor. An oral notice or statement will not be sufficient nor will a notice or statement after the event.

The Contractor shall immediately notify the Owner of potential claim items for extra work. If the Contractor is directed by the Owner or performs work which is mutually deemed by the Contractor and the Owner not to be included under any of the items of the Bid and which has not been specifically ordered in writing by the Owner as extra work, the Contractor shall make a claim to the Owner for extra payment for such work by Written Notice within five (5) days after the occurrence, with detailed cost data to support the claim or the claim will not be considered.

If the Contractor's claim contains data that cannot be verified by the Owner's records, the data shall be subject to a complete audit by the Owner or its authorized representative if they are to be used as a basis for claim settlement.

If the Contractor wishes to make claim for an increase in the Contract Price or Contract Time, he shall submit all supporting data to the Owner and Engineer within twenty (20) Days from the time of initial occurrence. Failure to submit such data within twenty (20) Days shall be a conclusive waiver to such claim by the Contractor.

- 16.3 Claims, disputes, and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and claims in respect to changes in the Contract Price or Contract times will be referred initially to the Engineer in writing with a request for a formal decision in accordance with this paragraph. Written Notice of each such claim, dispute or other matter shall be delivered by the Contractor to the Engineer and the Owner promptly (but in no event later than twenty (20) days) after the start of the occurrence or event giving rise thereto, and written supporting data shall be submitted to the Engineer and the Owner promptly, (but not later than twenty (20) days) after the start of such occurrence or event and monthly thereafter for continuing events unless the Engineer allows an additional period of time for the submission of additional accurate data in support of such claim, dispute or other matter. The Owner shall submit any response to the Engineer and the Contractor within ten (10) days after receipt of the Contractor's last submission (unless the Engineer allows additional time).

The Engineer shall render a written decision within twenty (20) days of receipt of the Owner's response. The Engineer's written decision on such claim, dispute, or other matter shall be final and binding upon the Owner and Contractor unless, within twenty (20) days after issuance of the Engineer's written decision, either party appeals the decision by giving the other party and the Engineer written notice of a request for negotiation.

Within ten (10) days of the delivery of said Notice, senior representatives of the Owner and the Contractor, having authority to settle the dispute, and the Engineer shall meet at a mutually acceptable time and place, and thereafter as often as they reasonably deem necessary, to exchange relevant information and to attempt to resolve the dispute. The Owner's representative will participate in good faith during the negotiation and will have authority to approve changes in the Contract Time and Price.

In the event a mutually acceptable decision cannot be reached through negotiation within twenty (20) days of the appealing party's Notice, (or mutually agreeable longer period), or if the party receiving

such Notice will not meet within ten (10) days, the Owner or Contractor may declare, by written Notice, delivered to the other party and to the Engineer, that the negotiation was unsuccessful and may initiate further appeal.

Any further appeal shall be initiated by written Notice of the appeal by the Owner or Contractor to the Engineer and non-appealing party within twenty (20) calendar days of receipt of the Notice of unsuccessful negotiation. Failure to issue a Notice of appeal within said period will result in the Engineer's decision being final and binding to the fullest extent allowed by law. If a written Notice of appeal is issued, the claim or dispute may be submitted for non-binding mediation at the discretion of Owner. If Owner chooses non-binding mediation, it shall be a condition precedent to the institution of any further administrative, legal or equitable proceedings by either party

If the Owner requests mediation upon issuance of the Notice of appeal, the parties shall endeavor to agree to a single mediator to mediate the dispute in a session not to exceed one-half day in length, unless extended by the agreement of both parties. If the parties cannot agree on a single mediator, they shall request the chief judge of the local state circuit court to designate a mediator. Unless the parties mutually agree otherwise, the mediation shall occur within ten (10) days of the mediator's selection. The costs of the mediation shall be paid by the parties on a pro rata basis.

The results of successful mediation will be implemented by a Change Order. Should the mediation be unsuccessful, it shall be terminated by written Notice to all involved by the mediator or Owner or Contractor. The dispute resolution process shall then proceed in accordance with paragraph 16.4.

- 16.4. A formal proceeding may then be instituted by the appealing party in a forum of competent jurisdiction within the Owner's locality, to exercise such rights or remedies as the appealing party may have with respect to such claim, dispute or other matter in accordance with applicable state and city laws and regulations.

~~In the event of any litigation between the parties arising out of this Agreement, the prevailing party will be entitled to recover its attorneys' fees and expert fees, as well as all other costs and expenses of such litigation.~~

- 16.5. The Contractor shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with the Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as the Owner and the Contractor may otherwise agree in writing.

XVII. ENGINEER'S STATUS

- 17.1. All Work shall be performed under the general observation of the Engineer (if specified in the Special Provisions, otherwise, the Owner shall serve as the Engineer at its discretion). The Contractor shall carry out the Work in accordance with the Contract Documents. The construction means, methods, techniques, sequences of procedures, and safety precautions and programs in connection with the Work shall be at the direction and the responsibility of the Contractor. The Engineer shall have authority to and shall reject any and all Work whenever it is necessary to do so in order to insure the proper execution of the Work in accordance with the Contract Documents. The Engineer shall have no authority to approve or order changes in the Work that alter the terms or conditions of the Agreement. The Owner shall confirm by written Notice within fourteen (14) calendar Days any oral order, direction, requirement or determination.

- 17.2. In case of the termination of the employment of the Engineer, the Owner may appoint a capable and reputable Engineer as a replacement. The status under the Agreement of the Engineer shall be that of the former Engineer.
- 17.3. Approval by the Engineer of any materials, plans, equipment or drawings proposed by the Contractor, shall be construed only to constitute an approval of general design. Such approval shall not relieve the Contractor for any responsibility for the accurate and complete performance of the work in accordance with Contract Documents, or from any duty, obligation, performance guarantee or other liability imposed upon him by the provisions of the Agreement.
- 17.4 The Contractor may be required to accompany the Owner for an on-site review of the project after award, but prior to the pre-construction conference and issuance of the Notice to Proceed. The purpose of the on-site review will be to compile a property report that will list, according to the following categories, the properties affected by construction as determined mutually by the Contractor and the Owner, or his representative.
- A. Unrestrained access to and from residences and business locations. This includes but is not limited to, the following types of scheduled projects:
 - 1. Street repair (non-emergency) or improvement projects.
 - 2. Utilities repair (non-emergency) or improvement projects.
 - 3. Sidewalk repair (non-emergency) or improvement projects.
 - B. Right to enjoy one's residence or business free of disturbing and unusual environmental changes as a result of an Owner-authorized construction project. Examples of such changes are excessive noise, dust, light, as well as unusual working hours and odors. This includes, but is not limited to, projects such as:
 - 1. Drainage repair (non-emergency) or improvement projects.
 - 2. Sewage repair (non-emergency) or improvement projects.
 - C. The right to properly plan for the relocation of one's personal property which must be moved as a result of an Owner-authorized construction project. This includes, but is not limited to, the following:
 - 1. Trees, shrubs, plants and flowers.
 - 2. Play equipment.
 - 3. Portable buildings.
 - 4. Fences (above grade or underground electric pet containment).
 - 5. Automobiles.

The property report is to remain on file with the Owner and the Contractor until project closeout.

XVIII. NOTICE TO COMPLY ORDER

See page 105-15.

XIX. STOP WORK ORDER

See page 105-17.

End of Section

105 - 14

CITY/COUNTY OF _____

NOTICE TO COMPLY

Department of _____

Pursuant to Section _____ of the Code of the City/County of _____, Virginia, as amended, a City Manager/County Administrator Designee inspected your site at _____ on _____, 20____ at _____ a.m. / p.m.

The following conditions of noncompliance were noted:

- SILT FENCE DOWN
- DISTURBED AREAS NOT STABILIZED
- SEDIMENT TRAPPING DEVICES NOT INSTALLED PROPERLY
- TRACKING ON PUBLIC ROAD
- OTHER: _____

The following corrective measures are needed to bring you into compliance:

- _____
- _____
- _____
- _____

These measures are to be completed before _____, 20____.

Notice ordered by _____, on _____, 20____.
(Designee of City Manager/County Administrator)

Hand Delivered _____ Certified Mail _____

If you have any questions, please call _____.
(Telephone number)

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CITY/COUNTY OF _____

STOP WORK ORDER

Permit Number _____

Date _____

Department of _____

Pursuant to Section _____ of the Code of the
City/County of _____, Virginia, as amended, a substantial
Code violation exists at _____. You are
hereby notified that further work at this location must be

IMMEDIATELY DISCONTINUED

Corrective Measures Required:

Ordered by: _____, on _____, 20_____.
(Designee of City Manager/County Administrator)

Notice served to _____, on _____, 20____.

Stop Work Order in Effect Until _____

(Signature of Enforcement Officer)

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CITY/COUNTY OF _____

NOTICE TO COMPLY

Department of _____

Pursuant to Section _____ of the Code of the City/County of _____, Virginia, as amended, a City Manager/County Administrator Designee inspected your site at _____ on _____, 20____ at _____ a.m. / p.m.

The following conditions of noncompliance were noted:

- SILT FENCE DOWN
- DISTURBED AREAS NOT STABILIZED
- SEDIMENT TRAPPING DEVICES NOT INSTALLED PROPERLY
- TRACKING ON PUBLIC ROAD
- OTHER: _____

The following corrective measures are needed to bring you into compliance:

- _____
- _____
- _____
- _____

These measures are to be completed before _____, 20____.

Notice ordered by _____, on _____, 20____.
(Designee of City Manager/County Administrator)

Hand Delivered _____ Certified Mail _____

If you have any questions, please call _____.
(Telephone number)



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CITY/COUNTY OF _____

STOP WORK ORDER

Permit Number _____

Date _____

Department of _____

Pursuant to Section _____ of the Code of the
City/County of _____, Virginia, as amended, a substantial
Code violation exists at _____. You are
hereby notified that further work at this location must be

IMMEDIATELY DISCONTINUED

Corrective Measures Required:

Ordered by: _____, on _____, 20____.
(Designee of City Manager/County Administrator)

Notice served to _____, on _____, 20____.

Stop Work Order in Effect Until _____

(Signature of Enforcement Officer)

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SECTION 106

CONTROL OF MATERIAL

I. TESTS AND INSPECTIONS

- 1.1. All material and workmanship shall be subject to inspection, examination and test by the Owner at any time during manufacture and/or construction. The Owner shall have the right to reject defective material and workmanship or require their correction. **The City will furnish testing services for soil compaction and concrete.**
- 1.2. The Contractor shall provide at its expense the testing and inspection services required by the Contract Documents. The Owner will provide at his expense all inspection and testing services not required by the Contract Documents; provided, however, the Contractor will be responsible for the payment of all failing tests.
- 1.3. The Contractor shall furnish promptly without additional charge all reasonable facilities, labor, and materials, necessary and convenient for making such tests as may be designated in the Contract Documents. The Contractor shall work with the Owner and the Engineer in scheduling and coordinating Owner provided testing or inspection services.
- 1.4. If the Contract Documents, laws, ordinances, rules, regulations or orders of any public body having jurisdiction require any Work (or part thereto) specifically to be inspected, tested, or approved by someone other than the Owner, the Contractor shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, pay all costs in connection therewith, and furnish the Owner the required certificates of inspection, or approval. **All Components shall be listed and labeled by a nationally recognized testing lab.** The Contractor shall also be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for the Owner's acceptance of materials or equipment to be incorporated in the Work, or of materials, mix designs, or equipment submitted for approval prior to the Contractor's purchase thereof for incorporation in the Work.
- 1.5. Inspections, tests or approvals by the Owner shall not relieve the Contractor from its obligations to perform the Work in accordance with the requirements of the Contract Documents.
- 1.6. The failure of the Owner to reject or condemn materials and workmanship not conforming to the Contract Documents shall not prevent the Owner from rejecting materials and workmanship found not to be in accordance with the Contract Documents at any time prior to the acceptance of the completed Work, nor shall it be considered as a waiver of any nonconformance with the Contract Documents which may be discovered later, or as preventing the Owner at any time prior to the expiration of the guarantee period or of the expiration of any applicable statutory limitation period for legal actions for Contractor default from recovering damages for work not in accordance with the Contract Documents.

II. LABOR, MATERIALS AND EQUIPMENT

- 2.1. The Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. The Contractor shall at all times maintain good discipline and order at the site.

- 2.2. Unless otherwise specified, the Contractor shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all facilities and incidentals necessary for the furnishing, performance, testing, start-up, and completion of the Work.
- 2.3. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by the Owner, the Contractor shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents. **All material shall be manufactured within two (2) years of the bid date of the project.**
- 2.4. It shall be the responsibility of the Contractor to legally dispose of all excess material at his expense unless otherwise indicated on the Drawings and/or noted in the Specifications.
- 2.5. No material that is not required for the Work on this Project may be stored on site or within the Project boundaries or on land designated for Project use, unless approved by the Owner in writing prior to placement.
- 2.6. **Equipment Rental Reimbursement Rates: The contractor shall use the monthly rate, or a percentage thereof, for equipment as stated in the most current edition of the Rental Rate Blue Book for any and all claims for extra compensation, which may arise in the course of the work. Rates are based on Twenty-two (22) work days per month.**

III. WORK BY OWNER

- 3.1. The Owner may perform other work related to the Project at the site by the Owner's own forces, have other work performed by utility owners, or let other direct contracts for Work at the site. If the fact that such other work is to be performed was not noted in the Contract Documents, Written Notice will be given to the Contractor prior to starting any such other work.

End of Section

SECTION 107

LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

I. PERMITS AND REGULATIONS

- 1.1. The Contractor shall procure all permits and licenses pay all charges, fees and taxes and give all notices necessary and incidental to the due and lawful prosecution of the Work except those provided by the Owner, and specified in the Special Provisions.
- 1.2. The Contractor shall be fully responsible for knowledge of and shall abide by each and every law, rule or regulation of all public bodies having political jurisdiction over the Project and in force at the time of the Contract; including, the safety of persons or property and the protection of persons and property from damage, injury or loss. The Contractor shall erect and maintain all necessary safeguards for such safety and protection and hold harmless the Owner and its agents, officers, or employees against any claim for liability arising from or based on any violation, whether by himself, his agents, his employees or subcontractors. If the Contractor observes that the Contract Documents are at variance with any such law, he shall promptly notify the Owner in writing. The Contractor shall execute and file the documents, statements, and affidavits required under any applicable federal or state law or regulation affecting his Bid or Agreement or prosecution of the Work thereunder. The Contractor shall permit examination of any records made subject to such examination by any federal or state law or by regulations promulgated thereunder by any state or federal agency charged with enforcement of such law. The Contractor shall not be entitled to claim any damages for delay occasioned by compliance with such laws. Where such laws are changed during the course of the Agreement, and where such changes create additional costs to the Agreement or affect the time of the Agreement, such changes shall be made effective through Change Orders prepared in accordance with the Contract Documents.
- 1.3. The Contractor shall comply fully with the U.S. Department of Labor Safety and Health Regulation promulgated under the Occupational Safety and Health Act of 1970, as amended, and under Section 107 of the Contract Work Hours and Safety Standards Act, as amended. The Contractor shall also comply fully with the Overhead High Voltage Act as set forth in Chapter 30, Title 59.1 of the Code of Virginia; Subpart P - "Elevations, Trenching and Shoring", of the Virginia Occupational Safety and Health Standards for Construction Industry; the Virginia Confined Space Standard 1910.146 of the Virginia Occupational Safety and Health Standards for General Industry; and the "Underground Utility Damage Prevention Act" as set forth in Chapter 10.3, Title 56 of the Code of Virginia, 1950, as amended. The above listing of safety laws and regulations is for informational purposes and in no way alters or limits Contractor's responsibility to comply with the safety laws of all public bodies having jurisdiction as set forth in Section 107-1.2 above.

II. LAND, EASEMENTS, AND RIGHTS-OF-WAY

- 2.1. Prior to issuance of Notice to Proceed, the Owner shall obtain all land, easements, and rights-of-way necessary for carrying out and for the completion of the work to be performed and pursuant to the Contract Documents, unless otherwise specified herein or otherwise mutually agreed. A land surveyor licensed in the Commonwealth of Virginia must perform the layout. Easements for temporary uses and detours requested by the Contractor and approved by the Owner in lieu of a detour within the right of way or easement area shall be acquired by the Contractor without the Owner being a party to the Agreement.

- 2.2. The Owner shall provide to the Contractor information that delineates and describes the lands owned, rights-of-way, or easements acquired, and permits obtained.
- 2.3. The Contractor shall provide at its own expense and without liability to the Owner any additional land and access thereto that the Contractor may desire for temporary construction facilities, or for storage of materials. The Contractor shall not use private property in connection with the Work unless prior written permission is obtained from the property owner. A copy of the written permission indicating the name, address, and phone number of the property owner shall be furnished to the Owner. Upon completion of the use of the property, the Contractor shall also furnish the Owner a release signed by the property owner indicating that the property has been satisfactorily restored.
- 2.4. The Contractor shall acquire all necessary and appropriate Permit(s) from the locality, VDOT, or both, for entrance(s) to off-site storage or lay-down yard(s) and shall abide by all conditions required by the Permit. The Contractor shall be solely responsible for all costs incurred in acquiring the Permit and all costs associated with the efforts necessary to comply to Permit requirements.

The Contractor shall utilize the most direct means of access to the Work area and shall not access the Work area through adjacent neighborhoods, parking areas, etc. Any and all damages to adjacent areas resulting from the Contractor's activities shall be the sole responsibility of the contractor and shall be repaired at the Contractor's expense, to the complete satisfaction of the Owner, locality/VDOT, and the affected property owner(s).

III. PROTECTION OF WORK, PROPERTY & PERSONS

- 3.1. The Contractor will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to all employees on the Work and other persons who may be affected thereby, all the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor shall provide and maintain all necessary watchmen, barricades, lights, and warning signs, and take all necessary precautions for the protection and safety of the public.
- 3.2. The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. The Contractor shall erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection, and shall notify owners of adjacent utilities when prosecution of the Work may affect them. The Contractor shall remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any Subcontractor, or anyone for whose acts any of them will be liable.
- 3.3. The Contractor shall designate a responsible member of its organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated in writing by the Contractor to the Owner
- 3.4. In accordance with generally accepted construction practices, and the requirements of OSHA, the Contractor shall be solely and completely responsible for conditions of the Project site. This requirement shall apply continuously and not be limited to normal working hours. The Contractor shall comply with Federal and State safety regulations, at the site of the Work and provide such equipment and medical facilities as necessary to supply first aid service to anyone who may be

- injured. The Contractor shall promptly report in writing to the Owner all accidents whatsoever arising out of, or in connection with, the performance of the Work whether on, or adjacent to, the site and which caused death, personal injury or property damages, giving full details and statement of witnesses. In addition, if death or serious injuries or serious damages are caused, the accidents shall be reported immediately to both the Engineer and the Owner. If any claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts, in writing, to the Owner.
- 3.5. Until final acceptance of the Work by the Owner, the Contractor shall have charge and care thereof and shall take every precaution against damage to the Work or to any part thereof by action of the elements or from any other cause whether installed, in storage, or off-site. The Contractor shall rebuild, repair, restore, and make good damage to any portion of the Work occasioned by any of the foregoing causes before final acceptance and shall bear the expense thereof. The Owner may reimburse the Contractor for repair of damage to Work attributable to unforeseeable causes beyond the control of and without the fault or negligence of the Contractor. In case of suspension of work, the Contractor shall be responsible for the Project and shall take such precautions as may be necessary to prevent damage to the Work, provide for erosion and environmental control and drainage control, and erect any necessary temporary structures, signs, or other facilities at his own expense. During the suspension of Work, the Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established plantings, seeding, and sodding furnished under the Contract and shall take adequate precautions to protect new tree growth and other important vegetation against damage.
 - 3.6. Emergency traffic such as police, fire and disaster units shall be provided reasonable access to the work area at all times. The Contractor shall coordinate partial or full street closures with all emergency services, such as police, fire and disaster units, and shall bear the responsibility of notification to same of all closures, blockages and re-openings.
 - 3.7. The Contractor shall, during the progress of the Work and as directed by the Owner, remove from the Owner's property and from all public and private property and rights-of-way, at its own expense, all temporary structures, rubbish, debris, piles of earth, foreign matter, and waste materials resulting from his operations. The site of the Work shall be restored to the conditions existing before the Work was started, to the satisfaction of the Owner. Lawns, pavements, sidewalks, and other surfaces shall be preserved where practicable, but if damaged, shall be fully restored.
 - 3.8. The Owner may take corrective action if the Contractor fails to perform cleanup and restoration in an orderly, continuous, and expeditious manner. The Owner may take corrective action three days after delivery of notice to do so to the Contractor and deduct the cost from any monies due the Contractor.
 - 3.9. The Contractor shall preserve property and improvements along the lines of and adjacent to the Work unless their removal or destruction is called for by the Contract Documents. The Contractor shall use suitable precautions to prevent damage to such property.
 - 3.10. When the Contractor finds it necessary to enter on private property, he shall secure from the property owner or lessee a written permit for such entry prior to moving thereon. An executed copy of this permit shall be furnished to the Owner.
 - 3.11. The Contractor shall be responsible for damage or injury to property during the prosecution of the Work resulting from any act, omission, neglect, or misconduct in the method of executing the Work or attributable to defective Work or materials. This responsibility shall not be released until final acceptance of the Project.

- 3.12. When direct or indirect damage is done to property by or on account of any act, omission, neglect or misconduct in the method of executing the Work or in consequence of the non-execution thereof on the part of the Contractor, the Contractor shall restore such property to a condition substantially equal to that existing before such damage was done by repairing, rebuilding or restoring, as may be directed by the Owner, or making settlement with the property owner. The Contractor shall secure from the property owner a release from any claim against the Owner without additional compensation therefor. A copy of this release shall be furnished to the Owner.
- 3.13. All property boundary markers shown on the Drawings or discovered during the course of construction shall be protected. All property boundary markers disturbed due to construction activities shall be replaced by the Contractor at no expense to the Owner. Property boundary markers shall be restored by a surveyor licensed in the State of Virginia and all restored property boundary markers shall be shown on the Record Drawings.
- 3.14. The Contractor shall employ a licensed Plumbing Contractor, who shall obtain the necessary permits and shall do all Work on private property in accordance with the International Plumbing Code, latest edition. The Owner will obtain the permission of the property owner to work on private property. No payment will be made for work done on private property until all restoration work is complete to the satisfaction of the Owner and the homeowner.

The Contractor shall be paid based on the number of permits that have been signed and approved by the Building and Codes Inspector as evidenced by copies of the approved permits submitted to and accepted by the Engineer. Copies of permits shall be submitted with monthly invoices.

- 3.15. The Contractor will notify the affected property owners, in writing **ten (10)** calendar Days prior to commencement of Work. "Affected Property Owners" shall be those property owners whose properties are affected by construction on the Project in the following manner: (i) restrained access to and from residences and business locations; (ii) interference with the right to enjoy one's residence or business free of disturbing and unusual environmental changes as a result of the Project, such as excessive noise, dust, light, as well as unusual working hours and odors; and (iii) the relocation of personal property, such as trees, shrubs, plants and flowers, play equipment, portable buildings, fences and automobiles, which must be moved as a result of the Project. Such Notice shall be deemed properly given if mailed by first class, postage prepaid, to the address for the property owners shown in the local tax records.
- 3.16. It shall be the Contractor's paramount responsibility to additionally notify each residence and business that construction adjacent to their property is imminent. This notification will be given and noted no less than 48 hours prior to Work commencing adjacent to the affected property. The Notice from the Contractor shall be written and may be hand delivered to each affected residence and business. A separate Notice shall be delivered each time the entrance to each residence and business will be blocked or inaccessible.
- A. If this Notice is mailed, time is to be allowed such that receipt by the addressee is at least 48 hours prior to Work commencement. Such Notice shall be deemed properly given if mailed by first class, postage prepaid, to the address for the property owners shown in the local tax records. A duplicate copy of each mailed Notice is to be forwarded to the Owner.
- B. If this Notice is hand delivered, a duplicate copy of each Notice is to be forwarded to the Owner indicating the date of delivery and if personal contact was achieved.

IV. ENVIRONMENTAL STIPULATIONS

- 4.1. Any cost associated with violations of the law including, but not limited to, remediation, cleanup cost, fines, administrative or civil penalties or charges, and third party claims imposed on the Owner by any regulatory agency or by any third party as a result of the Contractor's noncompliance with federal, state, or local environmental laws and regulations or nuisance statutes by the Contractor or by Subcontractors, consultants, sub-consultants, or any other persons, corporations or legal entities retained by the Contractor for this Agreement, shall be paid by the Contractor.

No separate payment will be made for the Work or precautions described herein except where provided for as a specific item in the Agreement or except where provision has been made for such payment in these specifications.

- 4.2. Pollution:

A. Water

The Contractor shall exercise every reasonable precaution throughout the duration of the project to prevent pollution of rivers, streams, and impoundments. Pollutants such as chemicals, fuels, lubricants, bituminous, raw sewage, paints, sedimentation, and other harmful material shall not be discharged into or alongside rivers, streams, or impoundments or into channels leading to them.

Construction discharge water shall be filtered to remove deleterious materials prior to discharge into state waters. During specified spawning seasons, discharges and construction activities in spawning areas of state waters shall be restricted so as not to disturb or inhibit aquatic species that are indigenous to the waters. Neither water nor other effluence shall be discharged onto wetlands or breeding or nesting areas of migratory waterfowl. When used extensively in wetlands, heavy equipment shall be placed on mats. Temporary construction fills and mats in wetlands and flood plains shall be constructed of approved non-erodible materials and shall be removed by the Contractor to natural ground when the Owner so directs.

If the Contractor dumps, discharges, or spills any oil or chemical that reaches or has the potential to reach a waterway, he shall immediately notify all appropriate jurisdictional state and federal agencies and shall take immediate actions to contain, remove, and properly dispose of the oil or chemical.

Excavation material shall be disposed of in approved areas above the mean high water mark shown on the plans in a manner that will prevent the return of solid or suspended materials to state waters. If the mark is not shown on the plans, the mean high water mark shall be considered the elevation of the top of stream banks.

- 1. All waste materials, including but not limited to excavated materials, demolished pavement, arboreal (landscaping) waste and other debris, that are not suitable for project related purposes (e.g. backfill) or are surplus to the needs of the project, both as determined by the Engineer, shall become the property of the Contractor. The Contractor shall dispose of all such material in accordance with his accepted Disposal Plan at no additional cost to the City.**

2. **The contractor shall submit a Disposal Plan for review and acceptance by the Engineer prior to performing any work that might generate waste materials. The plan shall include a complete description of the materials that are expected to be encountered and their proposed disposal site(s). The Contractor may change his Disposal Plan only by written notice to the Engineer. The acceptance of a plan and/or any related notice to the Engineer must be evidenced by a written response from the Engineer.**
3. **The Contractor shall insure that all permits related to his disposal operations have been obtained, and the Contractor shall comply with all requirements of those permits. The Contractor shall show evidence that all required permits have been obtained for all disposal sites by submitting a copy of all such permits to the Engineer as part of the Contractor's Disposal Plan.**

Construction operations in rivers, streams, or impoundments shall be restricted to those areas where channel changes are shown on the plans and to those that shall be entered for the construction of structures. Rivers, streams, and impoundments shall be cleared of false-work, piling, debris, or other obstructions placed therein or caused by construction operations.

The Contractor shall prevent stream constriction that would reduce stream flows below the minimum, as defined by the State Water Control Board, during construction operations. If it is necessary to relocate an existing stream or drainage facility temporarily to facilitate construction, the Contractor shall design and provide temporary channels or culverts of adequate size to carry the normal flow of the stream or drainage facility. The Contractor shall submit a temporary relocation design to the Owner for review and acceptance in sufficient time to allow for discussion and correction prior to beginning the work the design covers. Costs for the temporary relocation of the stream or drainage facility shall be included in the Contract Price for the related pipe or box culvert.

When a live watercourse must be crossed by construction vehicles more than twice in any six month period, a temporary vehicular stream crossing constructed of non-erodible material shall be provided.

Contractor shall comply with all provisions of the latest edition of the Virginia Erosion and Sedimentation Control Handbook.

B. Air

The Contractor shall comply with the provisions of the State Air Pollution Control Law and Rules of the State Air Pollution Control Board, including notifications required therein.

Burning shall be performed in accordance with applicable local laws and ordinances and under the constant surveillance of watchpersons. Care shall be taken so that the burning of materials does not destroy or damage property or cause excessive air pollution. The Contractor shall not burn rubber tires, asphalt, used crankcase oil, or other materials that produce dense smoke. Burning shall not be initiated when atmospheric conditions are such that smoke will create a hazard to the motoring public or airport operations. Provisions shall be made for flagging vehicular traffic if visibility is obstructed or impaired by smoke. At no time shall a fire be left unattended.

Asphalt mixing plants shall be designed, equipped, and operated so that the amount and quality of air pollutants emitted will conform to the Rules of the State Air Pollution Control Board.

Emission standards for asbestos incorporated in the EPA's National Emission Standards for Hazardous Air Pollutants apply to the demolition or renovation of any institutional, commercial, or industrial building, structure, facility, installation, or portion thereof that contains friable asbestos.

C. Noise

The Contractor's operations shall be performed so that exterior noise levels measured during a noise-sensitive operation shall not be more than 80 decibels within 100 feet from the point of origin or within ten (10) feet of a noise-sensitive facility. Noise-sensitive facility is any facility for which lowered noise levels are essential if the facility is to serve its intended purpose. Such facilities include, but are not limited to, those associated with residences, hospitals, nursing homes, churches, schools, libraries, parks and recreational areas.

The Owner may monitor construction-related noise. If construction noise levels exceed the specified limits, the Contractor shall take corrective action before proceeding with operations. The Contractor shall be responsible for costs associated with the abatement of construction noise and the delay of operations attributable to noncompliance with these requirements.

The Owner may prohibit or restrict to certain portions of the project any work that produces objectionable noise between 9 P.M. and 7 A.M. If other hours are established by local ordinance, the local ordinance shall govern.

Equipment shall in no way be altered so as to result in noise levels that are greater than those produced by the original equipment.

When feasible, the Contractor shall establish haul routes that direct his vehicles away from developed areas and ensure that noise from hauling operations is kept to a minimum.

~~These requirements are not applicable if the noise produced by sources other than the Contractor's operation at the point of reception is greater than the noise from the Contractor's operation at the same point.~~

D. Forest Fires

The Contractor shall take all reasonable precautions to prevent and suppress forest fires in any area involved in construction operations or occupied by him as a result of such operations. The Contractor shall cooperate with the proper authorities of the state and federal governments in reporting, preventing, and suppressing forest fires. Labor, tools, or equipment furnished by the Contractor upon the order of any forest official issued under authority granted the official by law shall not be considered a part of the Contract. For fires originating by no fault of the Contractor, the Contractor may negotiate with the proper forest official for compensation for such labor, tools, or equipment.

4.3. Archeological, Paleontological, and Rare Mineralogical Findings:

In the event of the discovery of prehistoric ruins, Indian or early settler sites, burial grounds, skeletal remains, relics, artifacts, fossils, stone tools, meteorites, or other articles of archeological, paleontological, or rare mineralogical interest during the prosecution of work, the Contractor shall act immediately to suspend work at the site of the discovery and notify the Owner. The Owner will immediately notify the proper state authority charged with the responsibility of investigating and evaluating such finds. The Contractor shall cooperate and, upon request by the Owner, assist in protecting, mapping, and removing the findings. Findings shall become the property of the Owner unless they are located on federal lands, in which event they shall become the property of the U.S. government.

When such work delays the progress of the Work, the Owner will give consideration to adjustments in the Contract Time limit. However, no adjustment in Contract Price nor Time will be allowed for delays that do not exceed 2 working days from the time the Contractor is notified to stop work. **If the contractor is assisting in removing the remains, the Owner will give consideration to adjustment in payment.**

V. TEMPORARY FACILITIES

5.1. The Contractor shall provide and maintain in a neat, sanitary condition such accommodations for the use of employees as may be necessary to comply with the requirements of any governing body and regulatory agency having jurisdiction.

The Contractor shall pay for and furnish temporary facilities (such as light, power, and water) complete with connecting piping, wiring, lamps, and similar equipment as necessary. The Contractor shall install, maintain, and remove temporary facilities upon completion of the Work. The Contractor shall obtain all permits and bear all costs in connection with temporary facilities at no expense to the Owner. The use of temporary facilities shall be in compliance with the requirements of the facility owner.

5.2. The Contractor shall provide at least one self-contained single-occupant toilet unit of the chemical, or aerated recirculation type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material. Unit shall be emptied and serviced regularly

VI. EMERGENCIES

6.1. In emergencies affecting the safety of persons, or the Work, or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Owner, shall act to prevent threatened damage, injury or loss. The Contractor shall give the Owner prompt Written Notice of any significant changes in the Work or deviations from the Contract Documents caused thereby. Any compensation, claimed by the Contractor on account of emergency work, shall be determined by agreement between the Owner and the Contractor, and a Change Order shall be issued to document the changes.

6.2. During the contract period, if an emergency situation (natural or manmade) occurs, the Contractor agrees to dedicate the equipment and personnel allocated to this project to assist the Owner during the recovery period. The Owner shall direct this work and costs will be paid on a time and material basis. Pre-approved rates will be applied as backed up by certified payrolls and rental rates.

- 6.3. **If an emergency situation should occur (natural or manmade) during the contract period and the project is shut down for any length of time, the contractor shall not receive any monetary compensation, with the exception of work performed to prepare the site for the impending event. However, an extension on contract time will be allowed.**

VII. WARRANTY AND GUARANTEE

- 7.1. The Contractor shall warrant and guarantee to the Owner that all Work is in accordance with the Contract Documents and is not defective. Prompt notice of all defects shall be given to the Contractor. The Contractor shall promptly correct all defective Work performed and replace defective materials or items found deficient during the final inspection, in a manner satisfactory and at no additional cost to the Owner for a period of one (1) year following the date of **Final Completion**; provided, however, if the local ordinances or code regarding warranties and guarantees, or if any provision in the local ordinances or code regarding the timing of performance or defect bonds conflicts with such one (1) year period, the local ordinance or code shall control. This warranty and guarantee shall not operate as a waiver of any of the rights and remedies of the Owner for default under or breach of the Agreement which rights and remedies may be exercised at any time within the period of any applicable statute of limitations.

The City shall hold a “pre-final” inspection to test all valves and hydrants. The City Inspector and representatives from the Water Distribution Division shall be present for the inspection. The final inspection will not be held until all deficiencies found in the pre-final inspection have been corrected.

- 7.2. Where defective Work (and damage to other Work resulting therefrom) has been corrected, removed or replaced under this Article, the correction period hereunder with respect to such Work will be extended for an additional period of one (1) year after such corrections or removal and replacement has been satisfactorily completed. Repetitive malfunction of an equipment or product item shall be cause for replacement and an extension of the correction period to a date one (1) year following acceptable replacement. A repetitive malfunction shall be defined as the third failure of an equipment or product item following original acceptance.
- 7.3. If the Contractor does not promptly correct the defective Work or replace defective materials, the Owner may have the defective Work corrected or the rejected Work removed and replaced, and all costs of such removal and replacement shall be paid by the Contractor.
- 7.4. Certain equipment or items may be required in the Contract Documents to be warranted for periods longer than one year.
- 7.5. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Contract Documents or by Change Order.

VIII. OPENING SECTIONS OF PROJECTS TO TRAFFIC

- 8.1. When specified in the Contract or when directed by the Owner, certain sections of the Work may be opened to traffic.
- 8.2. On any section of the Work opened by order of the Owner where the Contract Documents do not provide for traffic to be carried through the Work and the Contractor has not been dilatory in prosecuting the Work, the Contractor will not be required to assume any expense entailed in

maintaining the road for traffic. Such expense will be borne by the Owner or will be compensated for by Change Order. Repair of slides and repair of damage attributable to traffic will be compensated for by Change Order. The cost of all other repairs shall be borne by the Contractor.

- 8.3. On any section of the Work opened by the order of the Owner where the Contract Documents do not provide for traffic to be carried through the Work, any additional cost for the completion of other items of Work that are occasioned because of the changed working conditions will be compensated by Change Order.
- 8.4. If the Contractor is dilatory in completing the Work, he shall not be relieved of the responsibility for maintenance during the period the section is opened to traffic prior to final acceptance. Any expense resulting from the opening of such portions under these circumstances, except for slides, shall be borne by the Contractor. The Contractor shall conduct the remainder of the construction operations so as to cause the least obstruction to traffic.

IX. NO WAIVER OF LEGAL RIGHTS

- 9.1. The Owner shall not be precluded or stopped by any measurement, estimate, or certificate made either before or after final acceptance of the Work and payment therefor from showing (1) the true amount and character of the Work performed and materials furnished by the Contractor, (2) that any such measurement, estimate, or certificate is untrue or incorrectly made, or (3) that the Work or materials do not conform with the provisions of the Contract. The Owner shall not be precluded or stopped, notwithstanding any such measurement, estimate, or certificate, and payment in accordance therewith, from recovering from the Contractor or his surety, or both, such damage as it may sustain by reason of his failure to comply with the terms of the Contract. Neither the acceptance by the Owner or any representative of the Owner, nor any payment for or acceptance of the whole or any part of the Work, nor any extension of time, nor any possession taken by the Owner shall operate as a waiver of any portion of the Contract or of any power herein reserved or of any right to damages. A waiver of any breach of the Contract shall not be held to be a waiver of any other or subsequent breach. The Owner reserves all rights, privileges, immunities and defenses available to it at law.

End of Section

SECTION 108

PROSECUTION AND PROGRESS OF WORK

I. PATENT FEES AND ROYALTIES

- 1.1. The Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of the Owner its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by the Owner in the Contract Documents.
- 1.2. To the fullest extent permitted by Laws and Regulations, the Contractor shall indemnify and hold harmless the Owner, the Engineer, the Engineer's Consultants and the officers, directors, employees, agents and other consultants of each and any of them from and against all claims, costs, losses and damages arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product or device not specified in the Contract Documents.

II. TAXES

- 2.1. The Contractor shall pay all sales, consumer, use and other similar taxes required to be paid by the Contractor in accordance with the Laws and Regulations of the Project that are applicable during the performance of the Work. (The Contractor may apply to the Virginia Department of Environmental Quality for tax exempt status for certain wastewater products.)

III. NOTICE TO PROCEED

- 3.1. Written Notice to Proceed will be given after the Agreement has been executed and the required Bid Security and insurances have been filed with and approved by the Owner.
- 3.2. The Contractor shall notify the Owner and all other governing bodies having jurisdiction, of the time and location that work will begin at least 48 hours prior to beginning Work.

IV. PRE-CONSTRUCTION CONFERENCE

- 4.1. Within ten (10) Days of the Effective Date of the Agreement, a conference attended by the Contractor, the Owner, and others as appropriate will be held to discuss the Project, and to discuss procedures relating to Shop Drawings, submittals, Applications for Payment, and other Project issues, and to establish a working relationship among the parties as to the Work.

V. CONSTRUCTION PROGRESS SCHEDULE

- 5.1. Within ten (10) Days after the Effective Date of the Agreement, the Contractor shall submit a written schedule to the Owner showing the proposed order of Work and indicating the time required for completion of major items of Work. This schedule shall take into account the passage or handling of traffic with the least practicable interference and the orderly, timely and efficient prosecution of the Work. The schedule will be used as an indication of the sequence of the major construction

operations and as a check on the progress of the Work.

- A. **A construction schedule in the form of a critical path shall be submitted to the Owner as part of the submittal process prior to beginning construction and shall be updated when duration or sequencing changes.**
 - B. **Upon receipt of an approved “Work Schedule”, the Contractor shall submit to the Owner, within 10 days,**
 - 1. **An estimated payment schedule by each month of project duration.**
 - 2. **A composite curve to show the estimated value of work completed and stored materials less specified retainage.**
 - 3. **key months when work will be 50, 80, 90, and 100 percent complete shall be established.**
 - 4. **Identify when facilities will be fully operational.**
 - C. **During the course of work, the Contractor shall update with new composite curves at key months or whenever variation is expected to be more than plus or minus 10 percent. The original or previous composite curves shall be retained as dashed curves on all updates.**
 - D. **The Owner reserves the right to audit all reports and schedules. For cost-reimbursement contracts, change orders issued for fixed priced contracts or other contracts in excess of \$30,000, which include the provisions of services, the Contractor shall retain all books, records and other documents relative to this contract for five (5) years after final payment or until audited by the Office of the City Auditor or designee, whichever is sooner. The City of Norfolk Utilities Department its authorized agents and/or City Auditors shall have full access to and the right to examine and duplicate any of said materials during said period.**
- 5.2. The Contractor shall update the progress schedule monthly to reflect any schedule changes required to complete the remaining Work in accordance with the requirements of the Contract Documents. The updated schedule shall be submitted to the Owner for acceptance with the monthly application for progress payment; no payment will be made if the updated schedule is not submitted. All proposed adjustments in the progress schedule shall generally conform to the progress schedule then in effect and will comply with any provisions of the general requirements applicable thereto.

VI. SUBCONTRACTS

- 6.1. Except as otherwise noted, contract Work, the cost of which is at least ~~fifty percent (50%)~~ of the total Contract Price shall be performed by the Contractor’s own organization.
- 6.2. No part of the Work shall be transferred or subcontracted without prior written consent of the Owner, and no such consent or approval shall release the Contractor from any obligations to the Owner or persons employed by the Subcontractors, or to those supplying materials to the Subcontractors.
- 6.3. The Contractor agrees that it is as fully responsible to the Owner for the acts and omissions of its Subcontractors and persons either directly or indirectly employed by the Subcontractors as it is for the acts or omissions of persons directly employed.

- 6.4. Nothing contained in the Agreement shall create any contractual relation between any Subcontractor and the Owner.
- 6.5. **The Contractor shall provide the Owner, in writing, the names of any minority and disadvantaged business subcontractors to be used on the project on the form provided, including the estimated dollar amount of such subcontract and the minority classification of such subcontractors. A minority and disadvantaged business is one that is at least 51% owned by an Asian American, Black, Hispanic, American Indian, Eskimo, Aleut, or Female. No contract pay applications or invoices will be reviewed or processed until the Owner receives this information.**

VII. COMMENCEMENT AND PROSECUTION OF WORK

- 7.1. The Contractor shall commence Work within ten (10) Days of the date specified in the Notice to Proceed. Time being of the essence of this Project, the Contractor shall prosecute the Work diligently, using such means and methods of construction as will secure its full completion within the time period specified in the Agreement. No Work shall be done at the site prior to the date specified in the Notice to Proceed.
- 7.2. The Contractor shall proceed with the Work at such rate of progress to insure full completion within the Contract Time. It is expressly understood and agreed, by and between the Contractor and the Owner, that the Contract Time for the completion of the Work as specified in the Agreement is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the Project.
- 7.3. The Contract Time will commence on the date indicated in the Notice to Proceed.
- 7.4. Once the Contractor has commenced Work, it shall be prosecuted continuously and to the fullest extent possible except for interruptions caused by delays authorized or ordered by the Owner **by a Change Order or by weather.**

Except as set forth below, Contractor agrees that it will make no claim for damages arising from delay and that the Contractor's sole remedy for delay is to request a Change Order as set forth herein. The Contract time may be extended by Change Order for such reasonable time as the Owner determines if:

- i) The Contractor is delayed in the progress of work by any act or omission of the Owner or the Engineer, or by any separate Contractor employed by the Owner, or by strikes, lockouts, fire, adverse weather conditions not reasonably anticipated, or acts of nature;**
- ii) Such delay affects the overall completion of the work;**
- iii) The Contractor gives written notice to the Owner within 48 hours of the start of the occurrence, stating the cause of the potential delay and estimate of the possible time extension involved; and**
- iv) The Contractor gives written notice to the Owner of any actual time extension requested as a result of the aforementioned occurrences within 10 days after the delay has been remedied.**

Notwithstanding the foregoing, it is agreed that this paragraph does not prevent Contractor from making a claim for costs or damages for unreasonable delay caused by acts of omissions of the Owner, its agents or employees due to causes within their control, provided that the Contractor satisfies the notice requirements contained herein.

- 7.5. Gifts, gratuities, or favors shall not be given or offered by the Contractor to personnel of the Owner.
- 7.6. The Contractor shall not employ any personnel of the Owner or the Engineer for any services without the prior written consent of the Owner.
- 7.7. Workers shall have sufficient skill and experience to perform properly the Work assigned to them. Workers engaged in special or skilled work shall have sufficient experience in such work and in the operation of equipment required to perform it properly and satisfactorily. Any person employed by the Contractor or any subcontractor who, in the opinion of the Owner, does not perform his work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the Owner, be removed forthwith by the Contractor or subcontractor employing the person and shall not be employed again on any portion of the work without the approval of the Owner.
- 7.8. Equipment shall be of sufficient size and in such mechanical condition as to meet the requirements of the Work and produce a satisfactory quality of work. Equipment and the Contractor's methods and means shall be such that no damage to the roadway, adjacent property, or other highways will result from its use. The Owner may order the removal and require replacement of unsatisfactory equipment.

VIII. SUSPENSION OF WORK

- 8.1. The Owner may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than 90 Days or such further time as agreed upon by the Contractor, by Written Notice to the Contractor. Such Notice shall specify the date on which Work shall be resumed and the Contractor shall resume the Work on the date so specified. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if the Contractor makes a claim in accordance with the Contract Documents, except that no such increase or extension shall be allowed if the suspension was due to a failure by the Contractor to perform the Work in accordance with the Agreement.

IX. TERMINATION OF AGREEMENT

- 9.1. Termination for the Convenience of the Owner

The performance of Work under this Agreement may be terminated by the Owner in accordance with this section in whole, or in part(s), whenever the Owner shall determine that such termination is in the best interest of the Owner. Any such termination shall be effected by delivery to the Contractor of a notice of termination specifying the extent to which performance of Work under the Agreement is terminated, and the date upon which such termination becomes effective.

After receipt of a notice of termination, and except as otherwise directed by the Owner, the Contractor shall:

- A. Stop Work under the Agreement on the date and to the extent specified in the notice of termination.

- B. Place no further orders or subcontracts for materials, services, or facilities, except as may be necessary for completion of such portion of the Work under the Agreement that is not terminated.
- C. Terminate all orders and subcontracts to the extent that they relate to the performance of the Work terminated by the notice of termination.
- D. Assign to the Owner, and as directed by the Owner, all of the right, title and interest of the Contractor under the orders and subcontracts so terminated. The Owner shall have the right and discretion to settle or pay any and all claims arising out of the termination of such orders and subcontracts.
- E. Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Owner. This approval or ratification will be final for all purposes of this section.
- F. Transfer title and deliver to the Owner, as directed by the Owner, the fabricated or unfabricated parts, Work in process, completed Work, supplies, and other materials produced as a part of or acquired in connection with the performance of the Work terminated by the notice of termination, and the completed or partially completed plans, drawings, information and other property which, if the Agreement has been completed, would have been required to be furnished to the Owner.
- G. Use his best efforts to sell as directed or authorized by the Owner, property of the type referred to in Paragraph F above; provided, however, that the Contractor shall not be required to extend credit to any purchaser. The proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Owner to the Contractor under this Agreement or shall otherwise be credited to the Contract price or cost of the Work covered by this Agreement or paid in such manner as directed by the Owner. The Contractor may acquire any such property under the conditions prescribed and at a price or prices approved by the Owner.
- H. Complete performance of that Work which was not terminated by the Owner.
- I. Take such action as may be necessary, or as the Owner may direct, for the protection and preservation of the property related to this Agreement which is in the possession of the Contractor and in which the Owner has, or may acquire, an interest.
- J. Within 30 Days after the receipt of the Notice of termination, the Contractor may submit a list to the Owner for approval, certified as to quantity and quality of any or all items of, inventory not previously disposed of, exclusive of items, the disposition of which has been directed or authorized by the Owner, and may request the Owner to remove such approved items or enter into a storage agreement covering the same. Not later than 15 Days thereafter, the Owner will accept title to such approved items and remove them or enter into a storage agreement covering same. The list submitted shall be subject to final verification by the Owner upon removal of the items, or if the items were stored within 45 Days from the date of submission of the list. Any necessary adjustment to correct the list as submitted shall be made prior to final settlement.
- K. Within 30 Days after receipt of the notice of termination, the Contractor shall submit to the Owner his termination claim. Such claim shall be submitted in writing. Upon failure of the

Contractor to submit its termination claim within the time allowed, the Owner may, at its discretion, reject such termination claim. Such termination claim shall include the cost of the following:

1. The cost of supplies accepted by the Owner and not previously paid for by the Owner, appropriately adjusted for any saving of freight or other charges.
2. The cost incurred in the performance of the Work terminated, including Initial cost and preparatory expense allocable thereto, but exclusive of any cost attributable to supplies paid or to be paid for by the Owner.
3. The cost of settling and paying claims arising out of the termination of Work under subcontracts or orders which are properly chargeable to the terminated portion of the Agreement, exclusive of amounts paid or payable on account of supplies or materials delivered or services furnished by subcontractors or vendors prior to the effective date of notice of termination and previously paid for by the Owner.
4. A reasonable amount of profit or commission, which will be determined based on the Project's specific overhead and expense data at the rate computed in the original Contract Price or, at the discretion of the Owner, as determined by an audit. The cost of the audit will be borne by the Contractor.
5. Cost of reasonable storage, transportation and other costs incurred in connection with the protection or disposition of property allocable to this termination portion of the Agreement.
6. The total sum to be paid to the Contractor shall not exceed the Contract Price as reduced by the amount of payments previously made and its further reduced by the Contract Price of Work not terminated. Said total sum shall also be reduced by the reasonable value, as determined by the Owner, of property which is destroyed, lost, stolen, or damaged so as to become undeliverable to the Owner or to a buyer.

9.2. Termination with Cause/Default

In the event that the Contractor shall for any reason or through any cause be in default of the terms of this Agreement, the Owner may give the Contractor written Notice of such default by certified mail/return receipt requested at the address set forth herein.

Unless otherwise provided, Contractor shall have ten (10) Days from the date such notice is mailed in which to cure the default. Upon failure of the Contractor to cure the default, the Owner may immediately cancel and terminate this Agreement as of the mailing date of the default notice.

Upon termination, the Contractor shall withdraw its personnel and equipment, cease performance of any further Work under this Agreement, and turn over to the Owner any Work in process for which payment has been made.

In the event of violations of law, safety or health standards and regulations, this Agreement may be immediately canceled and terminated by the Owner and provisions herein with respect to opportunity to cure default shall not be applicable.

9.3. Contractor's Right to Terminate the Agreement

Should the Work be stopped for a period of 90 Days or more, through no fault of the Contractor, or should the Owner fail to pay the Contractor any payment within a reasonable length of time after said payment shall become due, the Contractor may, upon seven (7) Days written notice to the Owner, stop Work, or terminate the Agreement and recover from the Owner payment for all Work executed, plus any loss actually sustained, plus reasonable profit and damage; provided, however, the total recovery from Owner shall not exceed the Contract Price.

X. LIQUIDATED DAMAGES

- 10.1. It is mutually understood and agreed by and between the Contractor and Owner that in the execution of the Work, time is an essential element of the Agreement, and it is important that the Work proceed vigorously to completion.
- 10.2. The Owner has the right to deduct *any* liquidated damages from any money in the Owner's hands, otherwise due, or to become due, to the Contractor, and to sue for and recover any additional compensation for damages for non-performance of the Work or failure to complete the Work within the Contract Time.
- 10.3. The assessment of liquidated damages for failure to complete the Work within the Contract Time shall not constitute a waiver of the Owner's right to collect any additional damages that the Owner may sustain by failure of the Contractor to carry out the terms of the Agreement.

The contract will contain a clause deducting One Thousand Dollars and No Cents (\$1000.00) per calendar day as liquidated damages for failure to complete work prior to the established Substantial Completion date. And an additional Five Hundred Dollars and No Cents (\$500.00) per calendar day as liquidated damages for failure to complete work prior to the established Final Completion date. If substantial completion is not achieved by the time of final completion then liquidated damages for both substantial and final completion shall run concurrently until substantial completion is achieved.

- 10.4. In the event of delay in the completion of the Work as specified beyond the Completion Date as adjusted by Change Orders, it would be difficult to determine the exact amount of the loss or damages suffered by the Owner due to delays in completion of the Agreement. Therefore, for every - Day of delay past Completion Date of this Agreement as adjusted by Change Orders, the Contractor and the Contractor's Surety will be liable to the Owner, as liquidated damages for delay and not as a penalty, in the sum designated in Section 102, III. Bid Form, and in paragraph H of the Agreement between Contractor and Owner as set forth in Section 103, for each and every calendar Day the Contractor shall be in default, as follows:
 - A. If Substantial Completion has not been achieved by the scheduled Substantial Completion date, the Substantial Completion liquidated damages shall accrue each day until Substantial Completion is achieved.
 - ~~B. If neither Substantial Completion nor Final Completion has been achieved by the scheduled Final Completion date, only Substantial Completion liquidated damages shall occur each day until Substantial Completion is achieved and, thereafter, Final Completion liquidated damages shall accrue each day until Final Completion is achieved.~~

- C. If Substantial Completion has been achieved but Final Completion has not been achieved by the Final Completion date, Final Completion liquidated damages shall accrue each day until Final Completion is achieved.
 - ~~D. Substantial Completion liquidated damages and Final Completion liquidated damages shall not run concurrently.~~
 - E. The scheduled Final Completion date shall not be extended, in any case, solely because Substantial Completion was not achieved by the scheduled Substantial Completion date.
 - F. This paragraph will not apply to delays in completion of the Work due to acts of God, acts of the Public Enemy, acts of the Government (in either its sovereign or contractual capacity), fires, floods, strikes, or unusually severe weather, provided, that the Contractor shall, within five (5) days from the end of the month in which such delay occurred, notify the Owner in writing of the causes of delay and the facts relating thereto; and, provided that such delay occurs prior to the Substantial Completion date or, if Substantial Completion has been achieved, such delay occurs prior to the Final Completion date. Failure to provide such notice shall preclude the Contractor from claiming that delays resulted from the acts of God, acts of the Public Enemy, acts of the Government (in either its sovereign or contractual capacity), fires, floods, strikes, or unusually severe weather.
 - G. Nothing in the above clause shall be interpreted as limiting in any way, the Owner's right to proceed against the Contractor for additional damages or losses. Liquidated damages are for delay only and are in addition to any other rights available to the Owner by contract or law. To the fullest extent permitted by Laws and Regulations, the Contractor shall waive any defense as to the validity of such liquidated damages as set forth herein on the grounds that such liquidated damages are void as penalties or are not reasonably related to actual damages.
- 10.5. Weather shall be considered "unusually severe", only if a weather condition (or any combination of weather conditions) prevents the Contractor from working a number of workdays during a calendar month, which number exceeds the number of workdays listed below for that calendar month. Delays will only be allowed for the amount of lost work days in excess of the following:
- | | | | |
|----------|---|-----------|---|
| January | 6 | July | 4 |
| February | 4 | August | 3 |
| March | 4 | September | 3 |
| April | 3 | October | 3 |
| May | 4 | November | 3 |
| June | 4 | December | 5 |
- 10.6. The Contractor shall anticipate the potential loss of the number of workdays listed above for each calendar month due to weather, and shall schedule the Work accordingly. Any schedules submitted shall include the above number of days each month as lost days. The Owner shall determine, upon examination of submitted evidence, whether or not weather prevented the Contractor from performing Work on the days claimed by the Contractor. The Owner's determination shall be final and binding upon the parties.
- 10.7. The Work shall be considered complete when the following criteria have been met; all items of the Work have been constructed, inspected and accepted by the Owner and further that all punch list items have been corrected and the Owner has issued a letter of acceptance.

XI. SEPARATE CONTRACTS BY OWNER

- 11.1. The Owner reserves the right to award other contracts in connection with the Project, the work under which may proceed simultaneously with the execution of this Agreement. The Contractor shall afford other separate contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and the Contractor shall take all reasonable action to coordinate its Work with theirs. If the work performed by the separate contractor is defective or so performed as to prevent the Contractor from performing the Work, the Contractor shall immediately notify the Owner upon discovering such conditions. Upon receiving notification, the Owner shall take such appropriate steps as are necessary to allow the Contractor to perform Work under the Agreement, and appropriate extensions of time and change orders will be given to the Contractor, pursuant to the Agreement, to compensate for any delays and extra costs caused by separate contractor's performance.

XII. INDEMNIFICATION

- 12.1. To the fullest extent permitted by Laws and Regulations, the Contractor shall indemnify and hold harmless the Owner, the Engineer, the Engineer's Consultants and officers, directors, employees, agents and other consultants of each and any of them from and against all claims, costs, losses and damages (including, but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) caused by, arising out of or resulting from the performance of the Work, provided that any such claim, cost, loss or damage: (i) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, and (ii) is caused in whole or in part by any negligent act, errors, omissions, recklessness, or intentionally wrongful conduct of the Contractor, any Subcontractor, any supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of a person or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such person or entity.
- 12.2. In any and all claims against the Owner or any of the Owner's consultants, agents, officers, directors, or employees by any employee (or the survivor or personal representative of such employee) of the Contractor, any Subcontractor, any supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor or any such Subcontractor, supplier or other person or organization under workers' compensation acts, disability benefit acts or other employee benefit acts.
- 12.3. The indemnification obligations of the Contractor shall not extend to the damages caused by the Owner and the Owner's consultants, officers, directors, employees or agents resulting from the negligent preparation or approval of, Drawings, or Specifications.

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SECTION 109

MEASUREMENT AND PAYMENT

I. MEASUREMENT AND PAYMENT PROCEDURES

1.1. General

- A. Measurement will be made on the basis of completion of the Work in accordance with the Contract Documents and the appropriate specification section.
- B. Measurement of quantities will be made by the Contractor in the presence of the Owner. The methods of measurement and computations used in determination of quantities of materials furnished and installed shall be those generally recognized as conforming to good engineering practice.
- C. The term "Complete in Place" will mean that the item of Work shall be furnished and installed in accordance with the Contract Documents complete with all appurtenances necessary for the item to be used for its intended function. Testing and acceptable results shall be included.
- D. Linear foot and vertical foot measurements shall be measured along the horizontal plane of the ground or paved surface.
- E. Area computations shall be made on the surface. Pay measurements for area computations will not exceed plan dimensions as shown on the Drawings, unless otherwise approved by the Owner in writing.
- F. No payment will be made for length, width, or depth, in excess of that shown on the Drawings or specified in the Specifications for any construction, unless otherwise approved by the Owner in writing.
- G. The term "Each" when used as an item of payment will mean complete payment for the Work described in the Contract Documents.
- H. The word "Lump Sum" when used as an item of payment will mean complete payment for Work described in the item, including all materials, labor, and equipment necessary to complete the Work in accordance with the Contract Documents.
- I. Quantities will be measured and paid for in accordance with one of the following methods, and as specified on the Bid form

1.2. Incidental Items

- A. There are numerous incidental items of work that are required to complete the Project. While these items may not be specifically mentioned or illustrated by the Contract Documents and there may be no specific pay items listed for them, the Contractor will be required to perform those incidental tasks that can be anticipated through inspection of the Contract Documents, inspection of the construction area, and experience in this class of construction.

B. Items considered incidental work shall not be measured for payment or paid for as such unless specified as unit price by items on the bid form. These items and their costs shall be included in the unit prices or lump sum bid for the pay items unless bid separately. Incidental items include but are not limited to the following:

1. Allaying dust and mud
2. Daily cleanup
3. Excavation and dewatering
4. Furnishing, hauling, placing, manipulating, and compacting material
5. Location of existing utilities
6. Material royalties
7. Mobilization and demobilization
8. Offsite disposal of excess excavated, surplus and remnant excavated materials
9. Permits, unless provided by the Owner
10. Removal and replacement of existing signs, fences, mail boxes, and similar existing improvements
11. Site restoration and cleanup
12. Site security
13. Stakeout and surveying
14. Traffic control
15. Minor relocation of buried cables, gas lines, water lines, sewer lines, or similar utility lines 2 inches and smaller in diameter
16. Construction entrances
17. Pavement marking
- ~~18. Final Surface restoration~~
19. Top soil and seeding
20. Clearing and grubbing
21. Protection of existing utilities and other facilities.

**C. Description of Measurement and Payment Items
Refer to Section 110 - Special Provisions, Appendix D**

1.3 Schedule of Values for Lump Sum Bid Items

A. Within fourteen (14) days after the Effective Date of the Agreement, the Contractor shall submit a schedule of values for all of the Work which shall include quantities and prices of items aggregating the Contract Price and shall subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices shall include an appropriate amount of overhead and profit applicable to each item of Work. The Owner shall review the schedule and shall respond in writing to the Contractor within ten (10) Days either approving or disapproving the schedule. If the schedule of values is disapproved, the Contractor shall resubmit the schedule with revised value or additional substantiating data and the Owner shall either approve or disapprove the revised schedule within ten (10) Days. No payments shall be processed or approved until the schedule of values is approved by the Owner.

1.4 Application for Progress Payment by Contractor

A. Unless otherwise provided in this Section, the Owner shall make monthly progress payments to the Contractor on the basis of a duly certified and approved Application for

Payment for Work performed during the preceding calendar month as approved by the Owner.

- B. At least ten (10) Days before each partial progress payment (but not more often than once a month), the Contractor shall submit to the Owner an Application for Payment filled out and signed by the Contractor for the Work completed during the period covered by the partial progress payment estimate and supported by such data as is required by the Contract Documents.
- C. The schedule of values for lump sum items established as provided in Section 109-1.2 shall serve as the basis for progress payments and shall be incorporated into a form of Application for Payment acceptable to the Owner.
- D. **Record drawings must be submitted with monthly invoices in accordance with HRPDC Section 105.**

1.5 Payment for Material on Hand

If payment is requested on the basis of materials and equipment not incorporated in the Work, but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall be accompanied by a bill of sale, invoice or other instrument documenting that the materials and equipment are free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance, all of which will be satisfactory to the Owner. The Owner, at its sole discretion, may not pay for stored materials without prejudice and without cause.

1.6 Review of Applications for Progress Payments

- A. The Owner shall, within ten (10) Days after receipt of each Application for Payment, make such investigations as deemed necessary to verify the accuracy of the Application for Payment and either accept the application as accurate and suitable for payment or return the Application to the Contractor indicating in writing the Owner's reasons for refusing payment. If payment is refused, the Contractor shall make the necessary corrections and resubmit the Application and the Owner shall have an additional ten (10) Days after receipt of the corrected Application for Payment from the Contractor to determine whether this Application is accurate and suitable for payment.
- B. The Owner shall, within 30 Days after acceptance of the Application for Payment, make payment to the Contractor. The Owner may refuse to make payment of the full amount because claims have been made against the Owner on account of the Contractor's performance or furnishing of the Work, or because Liens have been filed in connection with the Work, or because there are other claims entitling the Owner to a set-off against the payment. The Owner shall give the Contractor immediate written Notice stating the reasons for its failure to make payment.
- C. The Owner may also refuse to make payment of the full amount because there are other items entitling the Owner to retain set-offs from the amount recommended, including but not limited to:
 - 1. Owner compensation to the Engineer for actual costs for extra personnel hours for labor plus expenses because of the following Contractor caused events:

- a. Witnessing re-testing of corrected or replaced defective work.
 - b. Return visits to manufacturing facilities to witness factory testing or re-testing.
 - c. Evaluation of proposed substitutes and in making changes to Contract Documents occasioned thereby.
 - d. Overtime worked by the Contractor necessitating the Engineer, Resident Project Representative (and support staff, if any), to work overtime.
2. Liability for liquidated damages incurred by the Contractor as set forth in the Agreement.
 3. Loss to Owner caused by Contractor acts or omissions including, but not limited to:
 - a. Defective Work not remedied;
 - b. Claims filed or reasonable evidence indicating probable filing of claims against the Contractor;
 - c. Failure of the Contractor to make payments properly to subcontractors or for materials or labor;
 - d. A reasonable doubt that the Project can be completed for the balance then unpaid;
 - e. Failure to maintain (each month) the record set of Drawings and Specifications. Failure to provide the Owner with record Drawings and Specifications within thirty (30) calendar Days from the date of the Substantial Completion;
 - f. Failure to periodically remove and dispose of accumulated debris, rubbish, and discarded/damaged materials;
 - g. Persistent failure to carry out the Work in accordance with the Contract Documents;
 - h. A reasonable doubt that the Work will be completed within the Contract Time.
 4. Failure of the Contractor to submit an updated progress schedule or other required supporting documentation (if requested by the Owner) to the Owner with the monthly application for progress payment.

1.7 Retained Funds

- A. The Owner shall retain **five percent (5%)** of the total amount of each partial progress payment to assure faithful performance of the Agreement by the Contractor. The Owner will release all retainage upon Final Payment.

- B. Pursuant to and in accordance with Section 2.2-4334 of the Code of Virginia, the Contractor may exercise the option to use the escrow account utilization procedure with respect to retained funds. The Contractor may do so by indicating its preference for this procedure in the appropriate space provided on the Bid Form.
1. Should this option be selected, the Contractor shall execute the Escrow Agreement and shall submit same to the Owner in the manner prescribed by law. If the Escrow Agreement form is not submitted as noted, the Contractor shall forfeit such rights to the use of the escrow account utilization procedure.
 2. In order to have retained funds paid to an escrow account, the Escrow Agreement shall be executed by the Contractor, the escrow agent, and the surety, and shall be submitted by the Contractor to the Owner for approval by the Owner's attorney. The Contractor's escrow agent shall be a trust company, bank or savings institution with its principal office located in the Commonwealth of Virginia. The Escrow Agreement shall contain the complete address of the escrow agent and surety, and the executed Escrow Agreement will be authority for the Owner to make payment of retained funds to the Escrow Agent. After approving the Escrow Agreement, the Owner shall pay to the escrow agent the funds retained as provided herein except that funds retained for lack of progress or other deficiencies on the part of the Contractor shall not be paid to the Escrow Agent. The Escrow Agent may, in accordance with the terms of the Escrow Agreement, invest the funds paid into the escrow account and pay earnings on such investments to the Contractor or release the funds to the Contractor provided that such funds are fully secured by approved securities.
 3. Retained funds invested and securities held as collateral for retainage may be released only as and when directed by the Owner. When the Final Payment is paid, the Owner shall direct to the Contractor monies due as determined by the Owner. The Owner reserves the right to recall retained funds and to release retained funds to the surety upon receipt of written request from the Contractor or in the event of default.
 4. The escrow account procedure shall apply to any contract for the sum of Two Hundred Thousand Dollars (\$200,000), or more, for construction of highways, roads, streets, bridges, parking lots, demolition, clearing, grading, excavating, paving, pile driving, miscellaneous drainage structures, and the installation of water, gas, sewer lines, and pumping stations.

1.8 Conditions of Payment to Contractor

- A. All material and Work covered by partial progress payments shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the safety and protection of all materials and Work upon which payments have been made or the restoration or replacement of any damaged or stolen Work or property or as a waiver of the right of the Owner to require the fulfillment of all the terms of the Agreement
- B. Prior to Substantial Completion, the Owner, ~~with the concurrence of the Contractor~~, may use any completed or substantially completed portions of the Work. Such use shall not constitute an acceptance of such portions of the Work.

- C. The Owner shall have the right to enter the premises for the purpose of doing work not covered by the Contract Documents. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of the Work, or the restoration of any damaged Work except such as may be caused by agents or employees of the Owner.
- D. The Contractor shall indemnify and save the Owner or the Owner's agents harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workmen, mechanics, material men, and furnishers of machinery and parts thereof, equipment, tools and all supplies, incurred in the furtherance of the performance of the Work. The Contractor shall, at the Owner's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the Contractor fails to do so the Owner may, after having notified the Contractor, either pay unpaid bills or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed, in accordance with the terms of the Contract Documents but in no event shall the provisions of this Section be construed to impose any obligations upon the Owner to either Contractor, the Surety, or any third party. In paying any unpaid bills of the Contractor, any payment so made by the Owner shall be considered as a payment made under the Contract Documents by the Owner to the Contractor and the Owner shall not be liable to the Contractor for any such payments made in good faith.
- E. The Contractor shall take one of the two following actions within seven (7) days after receipt of amounts paid to the Contractor by the Owner for Work performed by the Subcontractor under the Agreement:
1. Pay to the Subcontractor the proportionate share of the total payment received attributable to the Work performed by the Subcontractor under the Agreement; or
 2. Notify the Owner and Subcontractor, in writing, of his intention to withhold all or a part of the Subcontractor's payment with the reason for nonpayment.
- F. All contracts awarded by the Contractor to a Subcontractor for any portion of the Work shall include:
1. An interest clause that obligates the Contractor to pay interest to the Subcontractor on all amounts owed by the Contractor that remain unpaid after seven (7) days following receipt by the Contractor of payment from the Owner for Work performed by the Subcontractor under that contract, except for amounts withheld as allowed.
 2. An interest rate clause stating, "Unless otherwise provided under the terms of this contract, interest shall accrue at the rate of one percent per month."
 3. A payment clause that requires (i) individual contractors to provide their social security numbers and (ii) proprietorships, partnerships, limited liability companies and corporations to provide their federal employer identification numbers.
- G. The Contractor shall include in each of its subcontracts a provision requiring each Subcontractor to include or otherwise be subject to the same payment and interest

requirements as specified in Section 1.7 above, with respect to each lower-tier Subcontractor.

H. A Contractor's obligation to pay an interest charge to a Subcontractor pursuant to the payment clause in this section may not be construed to be an obligation of the Owner. A contract modification may not be made for the purpose of providing reimbursement for such interest charge. A cost reimbursement claim may not include any amount for reimbursement for such interest charge.

1.9 Final Payment

After the Contractor has completed all corrective Work as determined by a final inspection to the satisfaction of the Owner and has delivered all maintenance and operations manuals, schedules, guarantees, bonds, certificates of inspection, and other documents as required by the Contract Documents, the Contractor may make application for final payment following the procedure for partial progress payments. Within thirty (30) days after approval, the Owner shall pay to the Contractor the amount stated, less all prior payments and advances to or for the account of the Contractor. All prior estimates and payments including those relating to extra Work shall be subject to correction by this payment, which is called the Final Payment. The Contractor's obligation to perform the Work and complete the Project in accordance with the Contract Documents shall be absolute. Neither approval of any progress or Final Payment by the Owner nor the issuance of a Certificate of Substantial Completion, nor any payment by Owner to Contractor under the Contract Documents, nor any use or occupancy of the Project or any part thereof by Owner, nor any act of acceptance by Owner nor any failure to do so, nor any correction of defective Work by Owner shall constitute an acceptance of Work not in accordance with the Contract Documents.

1.10 Acceptance of Final Payment Constitutes Release

The acceptance by the Contractor of the Final Payment shall be and operate as a release to the Owner of all claims and of all liability to the Contractor for all things done or furnished in connection with this Work excepting the Contractor's claims for interest upon Final Payment, should this payment be improperly delayed. No payment, final or otherwise, or partial or entire use or occupancy of the Work by the Owner, shall constitute an acceptance of any Work or materials not in accordance with the Contract Documents, nor shall the same relieve the Contractor of responsibility for faulty materials or workmanship or operate to release the Contractor or his Surety from any obligation under the Contract, the Performance Bond and Payment Bond.

1.11 Assignments

Neither party to the Agreement shall sell, transfer, assign or otherwise dispose of the whole or any parts of the Agreement or of the right, title or interest therein without the prior written consent of the other, nor shall the Contractor assign any monies due or to become due hereunder, without the previous written consent of the Owner.

1.12 Payment Affidavit

The Owner, before making any payment, including the final payment, if it is deemed that such procedure necessary to protect his interests, may require the Contractor to furnish an affidavit from all subcontractors and material suppliers used in conjunction with this Contract that each has been paid in full, or in the alternative, an affidavit that so far as he has knowledge or information, all payments have been made and that there is no basis under which a claim against the payment bond

could be filed. However, the Owner may make payments in part or in full to the Contractor without requiring the affidavits, and the payments so made shall not impair the obligations of any Surety or Sureties on any bond or bonds furnished under this Contract.

II. CHANGE ORDERS AND FIELD ORDERS

- 2.1. The Owner may at any time, as the need arises, order changes within the scope of the Work without invalidating the Agreement. If such changes increase or decrease the amount due under the Contract Documents, or in the time required for performance of the Work, an equitable adjustment shall be authorized by Change Order.
- 2.2. The Contract Price and Contract Time may be changed only by a Change Order, approved by the Owner prior to the performance of the Work by the Contractor or granted by the Owner upon written Notice by Contractor submitted in accordance with Section 104-5.2 and 5.3 or Section 105-16. 2. The value of any Work covered by a Change Order or of any claim for increase or decrease in the Contract Price or Contract Time shall be established in accordance with the following methods in the order of precedence listed below:
 - A. established contract unit prices;
 - B. an agreed lump sum or unit price established by direct negotiation between the Contractor and the Owner;
 - C. In the event that any changes in the Work are not settled under A. and B. above, the Contract Price shall be adjusted for non-negotiated items in accordance with the following:
 1. In any case such change involves extra Work which is performed by the Contractor, the Contract Price shall be increased by fifteen (15%) for overhead and profit. ~~(a) the direct cost of such Work, as mutually agreed upon or otherwise as determined in accordance with the Contract Documents, and (b) ten percent (10%) of the amount of (a) to cover Contractor's additional job (field and home office) overhead, and (c) five percent (5%) of the sum of (a) and (b) to cover Contractor's additional job profit.~~
 2. In any case such change involves extra Work which is performed by a Subcontractor, the Contract Price shall be increased by ten percent (10%) of total determined in paragraph C(1) above for overhead and profit. ~~(a) the amount paid by the Contractor to the Subcontractor for such extra Work, and (b) seven and one-half percent (7-1/2%) of the amount paid to the Subcontractor to cover the Contractor's additional job (field and home office) overhead and (c) five percent (5%) of the sum of (a) and (b) to cover Contractor's additional job profit. On Work performed by the Subcontractor, the Subcontractor shall be allowed overhead and profit in accordance with paragraph C(1) above.~~
 3. In the case of either subparagraph 1 or 2 above, the Contract Price shall also be increased by the corresponding increase in the cost of the Contractor's performance bond.

- 2.3. It is the Contractor's responsibility to notify his Surety of any change affecting the general scope of the Work or change in the Contract Price and/or Contract Time so that the amount of the applicable Bonds shall be adjusted accordingly. The Contractor shall furnish proof of such adjustment to the Owner.
- 2.4. Whenever changes, alterations, additions, omissions, or revisions are called for by the Owner for which the necessary Drawings and details have been completed and submitted to the Contractor, or when changes, alterations, additions or omissions are clearly given in writing to the Contractor, the Contractor is to submit an itemized statement of quantities and prices incidental to such revisions, changes, additions and omissions.
- 2.5. The Owner may at any time order minor changes within the scope of Work by issuing a Field Order. The Contractor shall proceed with the performance of any changes in the Work so ordered by the Owner unless the Contractor believes that such Field Order entitles the Contractor to a change in Contract Price or Time or both, in which event the Contractor shall give the Owner written Notice thereof within seven (7) days after the receipt of the ordered change. The Contractor shall not execute such changes pending the receipt of an executed Change Order or further instruction from the Owner. The Owner shall respond to such written Notice from Contractor within twenty-one (21) days after receipt.
- 2.6. If any item in the Agreement is determined to be unnecessary for the proper completion of the Work contracted, the Owner may, upon written Notice to the Contractor, eliminate such item from the Agreement. Payment will not be made for such item except that the Contractor shall be compensated for the actual cost of any Work performed for the installation of such item and the net cost of materials purchased, including freight and tax costs, as evidenced by invoice. No additional compensation will be made for overhead or anticipated profit.
- 2.7. The Contractor shall not be entitled to any adjustment in the Contract Price or Contract Time due to any condition or alleged condition if:
 - A. The Contractor knew of the existence of such conditions at the time the Contractor made a final commitment to the Owner in respect of Contract Price and Contract Time by the submission of a Bid; or
 - B. The existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test or study of the site and contiguous areas required by the Contract Documents to be conducted by or for the Contractor prior to the Contractor making such final commitment; or
 - C. The Contractor failed to give the written Notice within the time and as required by Section 104-5.2 and 5.3 or Section 105-16.2.

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III. CHANGE ORDER

City of Norfolk
DEPARTMENT OF UTILITIES
CHANGE ORDER

PROJECT: 0
CHANGE ORDER No. CONTRACT No.
DATE of CO: VENDOR CODE: CONTRACT TIME: Calendar Days
ACCOUNT No. (s):

Description of work under this contract:

Changes Ordered:

Reason for Change Order:
See Supplement Sheet and letters and / or facsimiles from:

Subject to the following conditions an equitable adjustment is established as set out below:

Contract Price	Contract Time
() Not Changed	() Not Changed
() Increased By Dollars	() Increased By Calendar Days
() Decreased By Dollars	() Decreased By Calendar Days

Contract Amount adjusted to \$**** Bonded amount is \$***. Bond rider is / is not required.

The foregoing is in accordance with your proposal (s) dated

and as listed below:

- A. The aforementioned change, and work affected thereby, is subject to all contract stipulations and covenants.
- B. The rights of the City are not prejudiced; and
- C. All claims against the City which are incidental to or as a consequence of the aforementioned changes are satisfied.

We are sending you the original and three (3) copies of this change order for your acceptance. Please return to us the original and (3) copies, all bearing your dated signature. One copy will be returned to you after approval by the City.

City of Norfolk By: Kristen M. Lentz, P.E. Date Directo of Utilities	Accepted by Contractor Company: 0 Signature: _____ Date: _____
---	--

I hereby certify that the money required for this change order is in the City Treasury to the credit of the fund from which it is to be drawn and not appropriated for any other purpose.

\$ _____ _____ _____ _____
 Amount Account No. Director of Finance Date

 Assistant City Manager Date

 City Attorney Date



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IV. APPLICATION FOR PAYMENT

PROJECT SUMMARY

Date: _____ Contractor's Name: _____
 Project Name: _____ Project Number: _____

Original Contract Amount: \$ _____
 Original Contract Time: _____ days
 Adjusted Contract Amount (by approved Change Orders): \$ _____
 Adjusted Contract Time (by approved Change Orders): _____ days
 Adjusted Contract Completion Date: _____

STATUS OF WORK PERFORMED

A. Total Value of All Work Performed to Date: \$ _____
 B. Less _____ % Retained by Owner: \$ _____
 C. Net Amount Earned on Contract to Date: (A-B) \$ _____
 D. Less Amounts of Previous Payments Approved: \$ _____

BALANCE DUE THIS PAYMENT: (C – D) \$ _____

Value of Work Remaining to be Completed: \$ _____
 Percentage Complete to Date (Value/Time): _____ % _____ %

CERTIFICATION OF CONTRACTOR

I certify to the best of my knowledge and belief that all items and amounts on the face of the attached estimate and invoice and this Application for Payment are correct; that all Work has been performed and/or material supplied in full accordance with the terms and conditions of the Contract Documents, including all duly authorized deviations, substitutions, alterations, additions and/or deletions; that the foregoing is a true and correct statement of the Contract Price up to and including the last day of the period covered by this estimate and Application for Payment; that no part of the "BALANCE DUE THIS PAYMENT" has been received; that all previous Progress Payments received on this Agreement have been applied by the undersigned to discharge in full all obligations of the undersigned incurred in connection with the Work covered by prior applications for payment under this Agreement; and that all materials and equipment incorporated in said payment or otherwise listed in or covered by this Application for Payment are free and clear of all liens, claims, security interest and encumbrances.

APPROVALS

This Application for Payment has been checked, verified and approved for payment by:

_____ Contractor	By	_____ Title	_____ Date
_____ Construction Inspector	By	_____ Title	_____ Date
_____ Engineer (Consultant)	By	_____ Title	_____ Date
_____ Project Manager (City of Norfolk)	By	_____ Title	_____ Date



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~~V. ESCROW AGREEMENT~~

~~THIS ESCROW AGREEMENT, made and entered into this _____ day of _____, 20____, by, between and among the _____ (Owner) and _____ (Contractor), and _____ (Bank), a trust company, bank, or savings and loan institution with its principal _____ office located in the Commonwealth and _____ (Surety), provides:~~

~~5.1. The Owner and the Contractor have entered into a n Agreement dated (*month, date, year*), with respect to a Project titled _____ (the Agreement). This Escrow Agreement is pursuant to, but in no way amends or modifies the Agreement. Payments made hereunder or the release of funds from escrow shall not be deemed approval or acceptance of performance by the Contractor.~~

~~5.2. In order to assure full and satisfactory performance by the Contractor of its obligations under the Agreement, the Owner is entitled to retain certain amounts otherwise due the Contractor, known as retainage. The Contractor has, with the approval of the Owner, elected to have such retainage held in escrow by the Bank. This document sets forth the terms of the escrow. The Bank shall not be deemed a party to, bound by, or required to inquire into the terms of the Agreement or any other instrument or agreement between the Owner and the Contractor.~~

~~5.3. The Owner shall from time to time pursuant to its Agreement pay to the Bank amounts retained by it under the Agreement. Except as to amounts actually withdrawn from escrow by the Owner, the Contractor shall look solely to the Bank for the payment of funds retained under the Agreement and paid by the Owner to the Bank.~~

~~The risk of loss by diminution of the principal of any funds invested under the terms of this Escrow Agreement shall be solely upon the Contractor.~~

~~5.4. Funds and securities held by the Bank pursuant to this Escrow Agreement shall not be subject to levy, garnishment, attachment, lien or other process whatsoever. The Contractor agrees not to assign, pledge, discount, sell or otherwise transfer or dispose of its interest in the escrow account or any part thereof, except to the Surety.~~

~~5.5. The following securities, and none other, are approved securities for all purposes of this Escrow Agreement:~~

~~A. Unites States Treasury Bonds, United States Treasury Notes, Unites States Treasury Certificates of Indebtedness or United States Treasury Bills;~~

~~B. Bonds, notes and other evidences of indebtedness unconditionally guaranteed as to the payment of principal and interest by the United States.~~

~~C. Bonds or notes of the Commonwealth of Virginia;~~

~~D. Bonds of any political subdivision of the Commonwealth of Virginia, if such bonds carried, at the time of purchase by the Bank or deposit by the Contractor, a Standard and Poor's or Moody's Investors Service rating of at least "A"; and,~~

~~E. Certificates of deposit issued by commercial banks located within the Commonwealth, including, but not limited to, those insured by the Bank and its affiliates.~~

~~F. Any bonds, notes, or other evidences of indebtedness listed in Paragraphs A through C may be purchased pursuant to a repurchase agreement with a bank, within or without the Commonwealth of Virginia having a combined capital, surplus and undivided profit of not less than \$25,000,000, provided the obligation of the Bank to repurchase is within the time limitations established for investments as set forth herein. The repurchase agreement shall be considered a purchase of such securities even if title, and/or possession of such securities is not transferred to the Escrow Agent, so long as the repurchase obligation of the bank is collateralized by the securities themselves, and the securities have on the date of the repurchase agreement a fair market value equal to at least 100% of the amount of the repurchase obligation of the Bank and the securities are held by a third party, and segregated from other securities owned by the Bank.~~

~~No security is approved hereunder which matures more than five years after the date of its purchase by the Bank or deposit by the Contractor.~~

~~5.6. The Contractor may from time to time withdraw the whole or any portion of the escrowed funds by depositing with the Bank securities approved, in writing, by the Owner in an amount equal to, or in excess of, the amount so withdrawn. Any securities so deposited or withdrawn shall be valued at such time of deposit or withdrawal at the lower par or market value, the latter as determined by the Bank. Any securities so deposited shall thereupon become a part of the escrowed fund.~~

~~Upon receipt of a direction signed by the chief administrative and financial official of the Owner, the Bank shall pay the principal of the fund, or any specified amount thereof, to the Owner. Such payment shall be made as soon as is practicable after receipt of the direction.~~

~~Upon receipt of a direction signed by either the chief administrative or the chief financial official on behalf of the Owner, the Bank shall pay and deliver the principal of the fund, or any specified portion thereof, to the Contractor, in cash or in kind, as may be specified by the Contractor. Such payment and delivery shall be made as soon as is practicable after receipt of the direction.~~

~~5.7. For its services hereunder the Bank shall be entitled to a reasonable fee in accordance with its published schedule of fees or as may be agreed upon by the Bank and the Contractor. Such fee and any other costs of administration of this Escrow Agreement shall be paid from the income earned upon the escrow fund and, if such income is not sufficient to pay the same, by the Contractor.~~

~~Under no circumstances shall the Owner be responsible to the Bank for any fee or costs of administering this Escrow Agreement, account, or escrow fund.~~

~~5.8. The net income earned and received upon the principal of the escrow fund shall be paid over to the Contractor in quarterly or more frequent installments. Until so paid or applied to pay the Bank's fee or any other costs of administration such income shall be deemed a part of the principal of the fund. All income earned shall be reported by the Bank to the Internal Revenue Service and other taxing authorities on the Contractor's Tax I.D. Number, except for interest withdrawn by the Owner pursuant to paragraph IV.~~

~~5.9. The Surety undertakes no obligation hereby but joins in the escrow Agreement for the sole purpose of acknowledging that its obligations as surety for the Contractor's performance of the Agreement are not affected hereby.~~

~~WITNESS the following signatures, all as of the day and year first above written.~~

OWNER:

Name of Owner

By:

Name

Title

CONTRACTOR:

Name of Contractor

Contractor's Tax I.D. Number

By

:

Officer, Partner, or Owner

BANK:

Name of Bank

Mailing Address for Payments

Account Number

By

:

President/Vice-President

SURETY:

Name of Surety

By

Attorney in Fact



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VI. AFFIDAVIT OF PAYMENT OF CLAIMS

BY: _____ (Contractor)

THIS DAY _____, personally appeared before me, _____, a Notary Public in and for the City/County/State of Virginia, and being by me first duly sworn states that all Subcontractors and suppliers of labor and materials have been paid all sums due them to date for work performed or materials furnished in the performance of the Agreement between:

_____ (Owner)

and _____ (Contractor)

dated _____, 20____, for the construction of _____

_____ or arrangements have been made by the Contractor satisfactory to such Subcontractors and suppliers with respect to the payments of such sums as may be due them by the Contractor.

CONTRACTOR

BY:

TITLE: _____

DATE: _____

SEAL OF CONTRACTOR

Subscribed and sworn to before me this _____ day of _____, 20____.

My commission expires on the _____ day of _____, 20____.

NOTARY PUBLIC

NOTARY SEAL



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VII. CERTIFICATE OF SUBSTANTIAL COMPLETION

Project Description: _____ Project No _____
 _____ Other: _____
 Location: _____ Completion Date: _____
 _____ Contract Date: _____
 Contract For: _____ Contractor: _____
 Owner: _____

This Certificate of Substantial Completion applies to all Work under the Contract Documents or to the following specified parts thereof:

TO WIT: The Owner and Contractor are hereby advised that the work to which this certificate applies has been inspected by authorized representatives of the Owner, Contractor, and Engineer, and that all Work is hereby declared to be substantially complete in accordance with the Contract Documents on:

 Date of Substantial Completion

A tentative list of items to be completed or corrected is attached hereto. This list may not be all-inclusive and the failure to include an item in it does not alter the responsibility of the CONTRACTOR to complete all items of the Work in accordance with the Contract Documents. When this certificate applies to a specified part of the Work, the items in this tentative list shall be completed or corrected by the CONTRACTOR within _____ days of the above date of substantial completion. The date of substantial completion is the date which all guarantees and warranties begin, except as follows:

This certificate is issued, accepted, and acknowledged by:

 Engineer By Title Date

 Contractor By Title Date

 Owner By Title Date



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VIII. STATEMENT OF SURETY COMPANY

IN ACCORDANCE with the provisions of the AGREEMENT dated _____, 20__,

BETWEEN _____
(OWNER)

AND _____
(CONTRACTOR)

THE _____
(SURETY)

SURETY on the Material and Labor Payment BOND of:

(CONTRACTOR)

after a careful examination of the books and records of said CONTRACTOR or after receipt of an affidavit from CONTRACTOR, which examination of affidavit satisfies SURETY that all claims for labor and materials have been satisfactorily settled, hereby approves of the final payment to the said _____, CONTRACTOR, and by these presents witnesseth that payment to the CONTRACTOR of the final estimates shall not relieve SURETY of any of its obligations to

(OWNER)

as set forth in the said SURETY COMPANY'S BOND.

IN WITNESS WHEREOF, said SURETY has hereunto set its hand and seal this _____ day of _____, 20__.

ATTEST:

(SEAL) _____ BY _____
PRESIDENT

NOTE: This statement, if executed by any person other than the President or Vice President of the Company, shall be accompanied by a certificate of even date showing authority conferred upon the person so signing to execute such instruments on behalf of the Company represented.

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IX. CONTRACTOR'S RELEASE

KNOW ALL MEN BY THESE PRESENTS THAT:

_____ (Contractor) of _____ County/City and State of _____ does hereby acknowledge that he has received this day from the _____ (Owner) the sum of One Dollar (\$1.00) and other valuable consideration in full satisfaction and payment of all sums of money owing, payable and belonging to _____ (Contractor) Dated _____, 20__.

NOW, THEREFORE, the said _____ (Contractor) _____ (for myself, my heirs, executors and adm inistrators; for itself, its successo rs and assigns) do by the se presents r emise, release, quitclaim and forever discharge the said _____, Owner, its successors and assigns, of and from all claims and demands arising from or i n connection with the said Agreement dated _____, 20__, and of and from all, and a ll manner of action and actions, cause and causes of action and actions, suits, debt s, dues, duti es, sum and sums of money accounts, reckonings, bonds, bills, speciali ti es, covenants, contr acts, agreements, promises, variances, damages, judgements, extents, executions, claims and demand, whatsoever in law or equity, or ot herwise which against the said _____, Owner, its successor s and assigns ever had, now have, or which (I, my heirs, executors, or administrators; it, its successors and assigns) hereafter can, shall or may have, for upon or b y reason for any matter, cause or thing whatsoever, from the beginning of the world to the date of these presents.

IN WITNESS WHEREOF _____ (Contractor) has caused these presents to be duly executed this _____ day of _____, 20__.

Signed, Sealed and Delivered
in the Presence of:

_____ CONTRACTOR _____
(SEAL)

BY: _____

Title

ATTEST:

SECRETARY



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SECTION 110

SPECIAL PROVISIONS

I. CONSTRUCTION DRAWINGS:

Drawings are the property of the Owner and shall not be used for any purposes other than those specified in these Contract Documents.

II. HAMPTON ROADS PLANNING DISTRICT COMMISSION REGIONAL CONSTRUCTION STANDARDS:

Prior to Construction, the Contractor is required to obtain a copy of the Hampton Roads Planning District Commission *Regional Construction Standards* (Fifth Edition), from the Hampton Roads Planning District Commission located in Chesapeake, Virginia.

The following modifications, additions, or deletions to the HRPDC *Regional Construction Standards* are hereby incorporated into the contract documents.

III. INSURANCE COVERAGE – OFF DUTY POLICE OFFICERS

When an off-duty officer is hired by a private contractor to direct traffic around the construction site on which the contractor is working, that officer becomes the “statutory employee” of the contractor. The contractor is responsible for providing workers’ compensation coverage for its employees, including the officer(s) it hires to direct traffic around its site. Va. Code § 65.2-302.

IV. SUPPLEMENTAL SPECIFICATIONS

The following Supplemental Specifications are hereby made a part of these construction contract documents and were prepared by, and are the responsibility of, Michael Baker Jr., Inc.

- 01330 Steel Pipe Corrosion Control
- 01331 Ductile Iron Pipe Corrosion Control
- 01710 Project Clean Up
- 02260 Excavation Support / Protection Systems
- 02315 Excavating, Backfilling and Compacting
- 02370 Erosion and Sediment Control
- 02510 Ductile Iron (DIP) Water Mains and Appurtenances
- 02511 Welded Steel Pipe
- 02514 Pressure and Leakage Tests
- 02520 Horizontal Directional Drilling (HDD)
- 03300 Cast-in-Place Concrete
- 09930 Welded Steel Pipe Coatings
- 13110 Corrosion Control

V. Appendices

- Appendix A – Substance Abuse and Drug-Free Work Place Ordinance
- Appendix B – Procurement Information Form
- Appendix C – Norfolk Modifications to HRPDC Regional Standards, 5th Edition
- Appendix D – Pay Item Descriptions
- Appendix E – SWPPP for Contractor Use
- Appendix F – Project Sign Detail
- Appendix G – Not Used
- Appendix H – Soil Borings
- Appendix I – Test Hole Results (Pipe)
- Appendix J – Contractor’s Use of Temporary Facilities and Staging Areas
- Appendix K – Not Used
- Appendix L – Host City Approvals
 - City of Portsmouth, Wetlands Review Exclusion Letter
 - City of Portsmouth, Site Plan Approval
 - City of Chesapeake, Site Plan Approval
- Appendix M – Regulatory Agency Approvals
 - Virginia Marine Resources Commission
 - U.S. Army Corps of Engineers

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SECTION 01330
STEEL PIPE CORROSION CONTROL

PART 1 GENERAL

1.01 DESCRIPTION

- A. These Specifications define materials and installation practices to minimize corrosion and to provide facilities for long-term corrosion monitoring of the proposed pipelines.
- B. Installation of corrosion control components shall be in accordance with the following Specifications and Drawings. The Engineer or Owner shall approve all installation practices and components.
- C. The corrosion control system shall include shop coating, sacrificial magnesium anode ground-beds, insulating flanges, and corrosion control test facilities.

1.02 SUBMITTALS

- A. General: Submit a minimum of twelve (12) copies of each of the following for the Engineer's and Owner's approval, plus any additional copies the contractor needs for his records.
- B. First Product Data: Submit manufacturer catalog cuts or other descriptive information for the specific materials required on this project for approval.
 - 1. Test Stations
 - 2. Shunt
 - 3. Wire and Cable
 - 4. Thermite Welding Equipment
 - 5. Coating for Thermite Welds
 - 6. Magnesium Anodes
 - 7. Insulating Flanges
 - 8. External Coating for Mechanical Joints and Insulating Flanges
 - 9. Electrical Separator
 - 10. Dielectric Coating
 - 11. Wire Connectors and Terminations
 - 12. Electrical Tape
 - 13. Field Test Equipment and Calibration Sheets
 - 14. Warning Tape
 - 15. Test Station Concrete
 - 16. Solder
 - 17. Fusion Bonded Epoxy Pipeline Coating
 - 18. Powercrete Pipeline Surface and Coating Protection
- C. Quality Assurance: Submit in conjunction with product data listed above:
 - 1. Installation and Test Personnel Qualifications for Corrosion Control Hardware
 - 2. Qualifications of NACE International Certified Corrosion Specialist.
 - 3. Proposed Test Data Forms
- D. Close-Out: Submit no later than 10 working days prior to final inspection
 - 1. Letter of Compliance
 - 2. Record Drawings
 - 3. Test Report

1.03 QUALITY ASSURANCE

- A. Qualifications: Installation, quality assurance, and testing personnel must have demonstrated experience with similar work.
 - 1. Personnel shall be specifically named in qualification submittal and have completed at least three successful corrosion control systems within the last three years for underground pipelines of similar type, similar size and equal complexity.
 - 2. Personnel shall be full-time contractor or subcontractor employees. Part-time or contract personnel hired only for this work will not be permitted.
 - 3. Only personnel approved by the Engineer or the Owner shall be permitted. Personnel changes during course of project must be minimized and submitted to the Engineer for approval at least two (2) weeks prior to planned implementation.
- B. Supervision: Contractor shall employ a Corrosion Specialist certified by NACE International as approved by the Engineer to perform the following:
 - 1. Oversee and certify installation and related testing, including magnesium anode ground-bed installations, and corrosion control equipment. Individual must participate in field activities to extent required by work.
 - 2. Issue letter of compliance indicating all corrosion control measures are satisfactorily installed and are in compliance with contract documents. The letter of compliance shall be signed by the NACE International Corrosion Specialist.

1.04 RECORD DRAWINGS

- A. General: Document installed location and configuration of each test station as follows:
 - 1. Test station number per the test station schedule on the Drawings and installed pipeline station number.
 - 2. Three-dimensional ties between test station and existing permanent datum.
 - 3. Wire routing, size, insulation color and termination configuration on terminal board.
 - 4. Pipeline station numbers for wire attachments to pipe.
 - 5. Anode locations, where installed, including pipeline station number, depth and distance from centerline of pipe.

PART 2 PRODUCTS

2.01 TEST STATIONS

- A. Flush Mount Valve Box Type
 - 1. Approved Manufacturers: Bingham and Taylor or approved equal.
- B. Materials
 - 1. The test station shall be the City of Norfolk standard cast iron valve box with custom logo on lid.
 - 2. "City of Norfolk CP Test" shall be cast into the cast iron lid in 1-inch high letters.
 - 3. The valve box and lid shall be coated with two coats of shop applied OSHA safety blue polyurethane or epoxy paint.
 - 4. The terminal board shall be 4 inch by 6 inch by 0.25 inch thick phenolic board, 7 terminals, one 0.01 ohm (8 ampere) shunt, 2 copper shorting straps (0.50 inch wide by 0.03 inch thick by 1.5 inches long, with 2 holes predrilled for mounting) and 0.25 inch diameter nickel plated brass hardware. Terminal number identifications shall be engraved into the terminal board in accordance with the Corrosion Control Detail Drawings.

2.02 CURRENT MEASURING SHUNT

- A. Materials
 - 1. Test station shunts shall be constructed to fit the terminal posts for the specified test station. The resistance shall be 0.01 ohm with a current capacity of 8 amperes. The shunt shall be as manufactured by Cott Manufacturing Company Model "Yellow" or approved equal.

2.03 WIRE AND CABLE

- A. Materials
 - 1. All wiring shall be stranded or solid copper wire of the AWG wire size and color shown on the Drawings.
 - 2. Wire for test stations shall be single conductor, solid copper wire with 600-volt THWN or HMWPE insulation (colors, size and insulation as shown on details on Drawings).
 - 3. Wire for anode header cable shall be AWG No. 8 single conductor, stranded copper with high molecular weight polyethylene (HMWPE) insulation (black).

2.04 THERMITE WELDING EQUIPMENT

- A. Approved Manufacturers:
 - 1. Erico Products Inc., Cleveland, OH: Cadweld.
 - 2. Continental Industries, Inc., Tulsa, OK: Thermoweld.
- B. Materials: Mold, weld metal, other material and equipment per manufacturer's recommendations for particular pipe/cable material and size. Only material and equipment from same manufacturer is allowed. Adapter sleeves shall be utilized for all thermite welds.

2.05 THERMITE WELD COATING MATERIALS

- A. Manufacturers:
 - 1. Weld Caps: Royston Laboratories Division, Model Handy-Cap, or approved equal.
 - 2. Primer: Royston Laboratories Division, Roybond 747 Primer, or approved equal.
- B. Materials: Thermite welds shall be coated with a prefabricated assembly specially designed for covering cathodic protection wire connections to piping and fittings. The prefabricated assembly shall consist of the following components:
 - 1. Top plastic sheet formed with an igloo shaped dome and entry tunnel for the lead wire
 - 2. A special elastomeric compound in the plastic dome firm enough to resist flow at normally encountered application and operating temperatures, but soft enough to mold itself around and completely cover the irregular welded profile
 - 3. A double row of parallel, flexible serrations on either side of the dome to assist with conforming around small diameter pipe
 - 4. A base of black un-backed elastomeric tape with exceptional adhesive properties for bonding firmly to a surface when used with the appropriate primer

2.06 FUSION BONDED EPOXY PIPELINE COATING

- A. General: The external surface of the pipeline shall be shop coated with Fusion Bonded Epoxy Powder Coating, and all welded joints shall be coated with a compatible epoxy coating as recommended by the coating manufacturer.
 - 1. Materials: 3M Scotchkote Fusion Bonded Epoxy Powder Coating 6258. One-part, heat curable, thermosetting epoxy coating designed for corrosion protection of pipe. Coating thickness shall be 15-20 mils.
 - 2. Approved Manufacturer: 3M, St. Paul, MN

2.07 POWERCRETE PIPELINE SURFACE AND COATING PROTECTION (FOR DIRECTIONAL DRILL)

- A. General: Powercrete shall only be applied over the fusion bonded pipeline coating on the external surface of the pipeline.
 - 1. Materials: Epoxy based polymer concrete used to protect fusion bonded epoxy during boring and drilling and pull back operations.
 - 2. Approved Manufacturer: Power Lone Star, Inc., Tulsa, OK

2.08 WIRE CONNECTORS & TERMINATIONS

- A. Terminal Lugs
 - 1. Approved Manufacturer: Thomas and Betts Corporation, Raritan, NJ: Series 54100 and Model C10-14.
 - 2. Materials: One-hole, compression terminal lugs for 0.25-inch bolt size.
- B. Butt Splices
 - 1. Approved Manufacturer: Thomas and Betts Corporation, Raritan, NJ: Series 5450 and Model 210.
 - 2. Materials: Non-insulated type.

2.09 ELECTRICAL TAPE

- A. Vinyl Plastic
 - 1. Approved Manufacturers: 3M Company, St. Paul, MN: Scotch 88, or approved equal.
- B. Rubber Splicing
 - 1. Approved Manufacturers: 3M Company, St. Paul, MN: Scotch 130C, or approved equal.

2.10 FIELD TEST EQUIPMENT AND CALIBRATION SHEETS

- A. Field test equipment and calibration sheets shall be as determined by Contractor to meet specific requirements. All electrical instruments must bear evidence of calibration within 1 year of testing.

2.11 UTILITY WARNING TAPE

- A. Approved Manufacturers:
 - 1. Allen Systems, Houston, TX: Detectatape.
 - 2. Lineguard, Inc., Wheaton, IL: Lineguard Super Tuff III.
- B. Materials: Minimum 3 inch wide detectable warning tape, red or yellow in color, marked "Caution Cathodic Protection Cable Buried Below" at maximum intervals of 36 inches.

2.12 TEST STATION CONCRETE

- A. Materials: Ready-mix concrete conforming to ASTM C94. Minimum allowable 28-day compressive field strength shall be 3,000 psi (Class A3) when cured and tested in conformance with ASTM C31 and ASTM C39. Portland cement shall be Type 1.

2.13 SOLDER

- A. Materials: 0.062 inch diameter 60/40 Solder with 3.5 percent type RMA rosin core.

2.14 MAGNESIUM ANODES

- A. Approved manufacturers:
 - 1. Stuart Steel Protection Company
 - 2. Corrpro
- B. Materials
 - 1. Each anode shall have the following nominal weight and dimensions:
 - a. 32 lb.- 21 inches long and D-shaped (5 inches by 6 inches by 4.5 inches)
 - b. Composition of anode
 - i. Aluminum 0.010% maximum
 - ii. Manganese 0.50 to 1.3%
 - iii. Copper 0.02% maximum
 - iv. Nickel 0.001% maximum
 - v. Zinc 0.05% maximum
 - vi. Iron 0.03% maximum
 - vii. Silicon 0.05% maximum
 - viii. Other 0.05% each or 0.030% maximum total
 - ix. Magnesium remainder
 - c. Anode backfill
 - i. Hydrated Gypsum 75%
 - ii. Bentonite 20%
 - iii. Sodium Sulfate 5%
 - d. Anode Lead Wire
 - i. Minimum of 10 feet of AWG No. 12 solid copper wire with TW insulation (black) shall be attached to anode. Wire anode attachment shall be by silver solder and sealed to prevent a moisture penetration.

2.15 ELECTRICAL SEPARATOR

- A. Stuart Rock Stop
- B. Approved Manufacturer:
 - 1. Stuart Steel Protection Corporation

2.16 INSULATING FLANGES

- A. Materials:
 - 1. Insulating Gasket: Type "E" Neoprene-faced Phenolic. Machined to match particular pipe material being used. Inside diameter to be 3/32 inch greater than the nominal inside pipe diameter.
 - 2. Insulating Sleeves: G-10 Epoxy/Glass
 - 3. Insulating Washers: G-10 Epoxy/Glass. Provide two washers for each bolt.
 - 4. Steel Washers: 1/8 inch thick plated hot rolled steel. Provide two washers for each bolt.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Handling of Pipe
1. At the project site, the pipe shall not be handled with metal chains, cables, unpadded tongs, forklifts or other equipment likely to cause damage to the pipe shop coating or score the pipe surface.
 2. Storing the pipe shall be on padded 12-inch wide (minimum) skids or selected loamy or sand dirt berms, where possible. In urban areas, pipe shall be suspended on padded skids. Where skid chucks are used in contact with the pipe, they shall be padded with several layers of padding material. Padded chucks shall be placed such that pipe is nested on the skid rather than the chuck. The coated pipe shall not be laid on pavement without benefit of padding at contact points.
 3. If cables or chains are used during transportation, they shall be properly padded with approved, suitable material as required to protect the pipe surface from damage while in transit. Use of a padded horizontal separator strip between successive rows of pipe is necessary to prevent damage to the pipe surface.
 4. At all times during construction of the pipeline, the Contractor shall take every precaution to prevent damage to the protective shop coating and scoring of the pipe surface. No metal tools or heavy objects shall be permitted to come into contact unnecessarily with the pipe surface.
- B. Thermite Welding: Attach test wires and bond cables to the piping by thermite welding.
1. General: All thermite welds shall be made as shown on the Drawings and in accordance with the manufacturer's recommendations, using the proper combination of equipment for the pipe and wire size being welded. All welding materials and equipment shall be the product of a single manufacturer.
 2. Area Preparation: Assure that the area where the attachment is to be made is absolutely dry. Remove mill coating, dirt, grime and grease from the pipe or fitting surface at the weld location by wire brushing or by the use of suitable safety solvents. Clean an area (two inches square) of the pipe or fitting surface at the weld location to a bright shiny surface as found in standard SPC-SP11. This standard covers the requirements for power tool cleaning to produce a bare metal surface and to retain or produce a minimum 25 micrometer (1.0 mil) surface profile free of all serious pits and flaws.
 3. Cable Preparation: Prepare the wire for welding by assuring that the cable is absolutely dry. The cable shall be free of dirt, grease and other foreign products. Cut the cable in such a way as to avoid flattening or forcing out of round. To prevent deformation of the cable, cut the cable with cable cutters. Remove the insulation in a manner that will avoid damage to strands. Install adapter sleeves for all test wires in accordance with the manufacturer's recommendations prior to welding. Hold the cable at an approximate 30-degree angle to the pipe surface when welding.
 4. Installation: Install thermite welds in accordance with the manufacturers written instructions. Deliver packaged weld charges to job site in new, unopened dry containers. Replace completed welds having burnt wire strands and wire strands not completely covered with weldment.
 5. Testing: When the weld has cooled, remove the weld slag and test the weldment for strength by striking a sharp blow with a two pound hammer while pulling firmly on the wire in direction parallel to pipe. Replace unsound welds and retest weldments.
 - a. Documentation: Record adequacy of test wire welds based on the above procedure and visual inspection before and after coating weld area.
 6. Cleaning and Replacing Molds: Thoroughly clean mold and mold covers after completion of each weld to assure that no slag will penetrate into the next weld. Replace molds periodically and where there is pitting or other wear conditions.
 7. Coating Thermite Welds: After soundness of the weld has been verified, thoroughly clean with a stiff wire brush and coat with an elastomeric cap. The elastomeric cap shall extend on all four sides beyond the cleaned area onto the pipe surface. Apply primer over the entire weld area and over the entire area where the elastomeric cap will be placed. Allow primer to dry. Push the dome of the prefabricated cap containing elastomeric material

firmly into weld area. Lift the wire away from the pipe and apply the elastomeric material completely around and underneath the wire. Push the wire back down on the pipe.

C. Magnesium Anode Lead Wire Splices, Wire Connectors and Terminations:

1. Magnesium Anode Lead to Header Cable Splices: Splice the AWG No. 12 solid copper wire supplied with the anode to an AWG No 8 HMWPE stranded copper cable through the use of a compression connector as shown. Tape the splice with three layers of high voltage rubber splicing tape (50% overlap), followed by three layers of vinyl electrical tape (50% overlap).
2. Terminal Board Connectors: Crimp and solder each terminal box wire to a one-hole terminal lug. Clean and dry wire and lug connector before soldering.
3. Wire Splicing: When wire splicing is required, use butt splice connector crimped, soldered, and insulated. Insulate splices by spirally wrapping (minimum 50% overlap with three layers of rubber splicing electrical tape and three layers of vinyl plastic electrical tape. Coat taped splice with electrical coating compound.
4. General: No splices allowed in individual anode wires, joint bonds, and pipe wires.

D. Magnesium Anodes:

1. Positioning: Position the anodes vertically with closest part of anode a minimum of 1 foot from main at or below elevation shown on Drawings. Spacing between anodes shall comply with the corrosion control design plan.
2. Installation in Rock Areas: If solid rock is encountered at a depth which will not accommodate normal installation, investigate immediate proximity to determine if anode can be installed at specified depth at another location in the immediate area.
3. Backfill: Use soil free from rock and organic material. Do not use sand or clay. After anode is covered with 1 foot of soil, pour 5 gallons of water over covered portion of anode.
4. Wiring: Unless noted otherwise, connect grouped anodes through an AWG No. 8-stranded copper header cable. Terminate each end of anode cable in designated test stations with only splicing of cable at anode wire attachments. Anode header cables shall be buried a minimum of 3 feet below grade. Install warning tape one foot above anode cable. Handle wire with care.
5. Documentation: Include location and orientation of each anode on Record Drawings.

F. Test Stations: Includes terminal box, concrete pad, wire leads, utility warning tape and monitoring equipment.

1. General: Type of test station; number, size and color of wires and wire routing are shown on the Drawings. Unless otherwise noted or approved by the Engineer or Owner, test stations for pipelines buried under pavement shall be located outside paving limits. Test stations shall be sufficiently set back from vehicle traffic lanes so that they can be accessed for maintenance without extensive traffic control or other special safety precautions.
2. Wire Routing: Install test and monitoring equipment wires in a wiring harness arrangement routed along the bottom of the pipe trench where practical. Form harness by taping wires together at intervals of 10 feet. Install wires leaving the pipe trench in 2" PVC conduit when terminal box is not installed over sewer main.
3. Utility Warning Tape: Install 1 foot above PVC conduit.
4. Concrete Pad:
 - a. Concrete Pad: Provide for each flush mount test station if the test station is installed out of paving or concrete sidewalk. Non-reinforced concrete pad formed around test station shall be 24 inches by 24 inches by 8 inches sloped away from terminal box.
 - b. Survey Marker: Mount flush with concrete during pad construction.

G. Clearance of Piping to Other Structures

1. 12 inches of natural clearance shall be maintained between the piping and other structures, where possible. When 12 inches of clearance cannot be maintained, install a high density

(Rock Stop) electrical separator secured with non-metallic tape to the sewer main and between the foreign structures.

- H. Insulated Flanges: Unless noted otherwise, install with a test station and two test wires attached to pipe on each side of flange.
1. Preparation: Clean mud, dirt, grease, oil and other contaminants from flange surfaces. Check flange face and bolt hole tolerances and verify clearances prior to installing insulating materials.
 2. Installation: Install insulated flange gasket, sleeves and washers under clean and dry conditions in accordance with manufacturer's written instructions. Two insulating washers required for each bolt (one for each side of flange). Properly torque bolts per insulating material manufacturer's instructions to avoid damage to insulating components and otherwise ensure electrical separation between flange faces and between each bolt and each flange. Do not use conductive grease or other material to facilitate flange assembly which could compromise electrical integrity of insulating materials.
 3. Initial Testing: After assembly, directly measure electrical resistance between each bolt and one flange using an ohm meter or other approved low voltage resistance meter. Resistances less than 10 megohm are not acceptable and require insulator replacement, cleaning and drying of insulator surfaces, and/or other corrective action. If any bolt fails the 10 megohm minimum resistance requirements, all bolts must be retested after corrections are made. Tests shall also be performed across the insulating flange to assure that the central gasket is providing effective insulation between the flanged faces prior to coating.
 4. External Coating: Coat buried insulating flanges with approved heat shrink sleeve. Surface preparation and coating application shall be as specified by manufacturer, including use of filler material to provide smooth contour around bolts and from transition between pipe and flange.
 5. Final Testing before Backfilling: A final test of the insulating flange shall be made from the attached test wires prior to backfilling. Tests shall be repeated from the insulating flange test wires after backfilling and after the test wires have been brought to grade.

3.02 TESTS

- A. General: The Engineer or the Owner's Inspector will witness testing at his option and discretion.
1. Test Data Forms: Record test data in a uniform format pre-approved by the Engineer. Include test data, personnel, and instrumentation used on each sheet.
 2. Testing Summary:
 - a. Pre-Backfill Tests
 1. Test wire integrity
 - b. Post-Backfill Tests
 2. Pipe-to-soil DC potential measurements
 3. Anode current measurements from test station shunts
 - c. Improper materials or installation determined by Contractor performed tests, and/or tests performed by the Engineer, shall be corrected by the Contractor.
 3. Schedule
 - a. Pre-Backfill Tests: Complete as work progresses.
 - b. Post-Backfill Tests: Start no sooner than 2 months before scheduled application for Beneficial Use.
 - c. Test Report: Letter of Compliance; Record Drawings: Submit no later than 10 working days prior to final inspection.
 4. Test Report
 - a. Raw test data for all pre-backfill and post-backfill tests.

- b. Test set-ups and schematics.
 - c. Letter of Compliance.
 - d. Record Drawings.
- B. Pre-Backfill Test Procedures
- 1. Test wire integrity tests
 - 2. Test electrical effectiveness of each buried insulating flange after installation
 - 3. Perform tests for completed insulators by a) use of a high frequency isolation tester manufactured specifically for this purpose, and by b) measuring electrical potential across the fitting after application of a direct test current to the pipe on one side of the fitting of no less than 1 ampere is applied. Documented data for tes b) shall include all potentials and applied test current.
 - 4. Acceptance Criteria:
 - a. High frequency isolation tester: Acceptable
 - b. Electrical potential/applied current: Apply test current to one side of the insulating fitting; a positive potential shift on the side of the flange where current is applied, and negative potential shift on the side of the flange opposite of where the current is applied indicates that the insulator is effective.
- C. Post-Backfill Test Procedures
- 1. Pipe-to-Soil Potential Measurements
 - a. Record at all test stations.
 - b. Collect using a temporary copper/copper sulfate reference electrode placed on grade within one foot of test station.
 - c. Collect at all locations prior to connecting anodes at test stations, and then after anodes have been connected at all test stations for a minimum of 2 hours.
 - 2. Anode Potential and Current Measurements:
 - a. Measure and record open-circuit potential between each anode cable at each test station and a temporary copper/copper sulfate reference electrode placed on grade within one foot of test station. Collect open circuit potential data with no other influencing anodes connected to main.
 - b. Measure and record anode current at each test station using permanently installed current measuring shunt. Document shunt voltage drop, shunt resistance, and calculated current.
 - c. Acceptance Criteria:
 - 1) Open-Circuit Potential: Magnitude 1.6 volts or greater.
 - 2) Anode Current: Minimum 0.02 ampere per anode, adjusted to account for number of anodes included in circuit at any given location (e.g. 15 anodes - minimum 0.30 ampere).
 - 3. Insulated Joint Effectiveness Tests: Test each joint. Procedures and acceptance criteria in accordance with pre-backfill insulated joint effectiveness tests.

END OF SECTION 01330

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SECTION 01331

DUCTILE IRON PIPE CORROSION CONTROL

PART 1 GENERAL

1.01 DESCRIPTION

- A. These Specifications define materials and installation practices to minimize corrosion and to provide facilities for long-term corrosion monitoring of the proposed pipelines.
- B. Installation of corrosion control components shall be in accordance with the following Specifications and the Drawings. The Engineer or Owner shall approve all installation practices and components.
- C. The corrosion control system shall include joint bonding at all pipe joint connections as per Design Drawings, sacrificial magnesium anode ground-beds, and corrosion control test facilities.

1.02 SUBMITTALS

- A. General: Submit a minimum of twelve (12) copies of each of the following for the Engineer's and Owner's approval, plus any additional copies the contractor needs for his records.
- B. First Product Data: Submit manufacturer catalog cuts or other descriptive information for the specific materials required on this project for approval.
 - 1. Test Stations
 - 2. Shunt
 - 3. Wire and Cable
 - 4. Thermite Welding Equipment
 - 5. Coating for Thermite Welds
 - 6. Magnesium Anodes
 - 7. Insulating Flanges
 - 8. External Coating for Mechanical Joints and Insulating Flanges
 - 9. Electrical Separator
 - 10. Dielectric Coating
 - 11. Wire Connectors and Terminations
 - 12. Electrical Tape
 - 13. Field Test Equipment and Calibration Sheets
 - 14. Warning Tape
 - 15. Test Station Concrete
 - 16. Solder
 - 17. Polyethylene Encasement
- C. Quality Assurance: Submit in conjunction with product data listed above:
 - 1. Installation and Test Personnel Qualifications for Pipe Joint Bonding and Corrosion Control Hardware
 - 2. Qualifications of NACE International Certified Corrosion Specialist.
 - 3. Proposed Test Data Forms
- D. Close-Out: Submit no later than 10 working days prior to final inspection
 - 1. Letter of Compliance
 - 2. Record Drawings
 - 3. Test Report

1.03 QUALITY ASSURANCE

- A. Qualifications: Installation, quality assurance, and testing personnel must have demonstrated experience with similar work.
 - 1. Personnel shall be specifically named in qualification submittal and have completed at least three successful corrosion control systems within the last three years for underground pipelines of similar type, similar size and equal complexity.
 - 2. Personnel shall be full-time contractor or subcontractor employees. Part-time or contract personnel hired only for this work will not be permitted.
 - 3. Only personnel approved by the Engineer or the Owner shall be permitted. Personnel changes during course of project must be minimized and submitted to the Engineer for approval at least two (2) weeks prior to planned implementation.

- B. Supervision: Contractor shall employ a Corrosion Specialist certified by NACE International as approved by the Engineer to perform the following:
 - 1. Oversee and certify installation and related testing. Including pipe joint bonding, magnesium anode ground-beds, and corrosion control equipment. Individual must participate in field activities to extent required by work.
 - 2. Issue letter of compliance indicating all corrosion control measures are satisfactorily installed and are in compliance with contract documents. The letter of compliance shall be signed by the NACE International Corrosion Specialist.

1.04 RECORD DRAWINGS

- A. General: Document installed location and configuration of each test station as follows:
 - 1. Test station number per the test station schedule on the Drawings and installed pipeline station number.
 - 2. Three-dimensional ties between test station and existing permanent datum.
 - 3. Wire routing, size, insulation color and termination configuration on terminal board.
 - 4. Pipeline station numbers for wire attachments to pipe.
 - 5. Anode locations, where installed, including pipeline station number, depth and distance from centerline of pipe.

PART 2 PRODUCTS

2.01 TEST STATIONS

- A. Flush Mount Valve Box Type
 - 1. Approved Manufacturers: Bingham and Taylor or approved equal.

- B. Materials
 - 1. The test station shall be the City of Norfolk standard cast iron valve box with custom logo on lid.
 - 2. "City of Norfolk CP Test" shall be cast into the cast iron lid in 1-inch high letters.
 - 3. The valve box and lid shall be coated with two coats of shop applied OSHA safety blue polyurethane or epoxy paint.
 - 4. The terminal board shall be 4 inch by 6 inch by 0.25 inch thick phenolic board, 7 terminals, one 0.01 ohm (8 ampere) shunt, 2 copper shorting straps (0.50 inch wide by 0.03 inch thick by 1.5 inches long, with 2 holes predrilled for mounting) and 0.25 inch diameter nickel plated brass hardware. Terminal number identifications shall be engraved into the terminal board in accordance with the Corrosion Control Detail Drawings.

2.02 CURRENT MEASURING SHUNT

- A. Materials

1. Test station shunts shall be constructed to fit the terminal posts for the specified test station. The resistance shall be 0.01 ohm with a current capacity of 8 amperes. The shunt shall be as manufactured by Cott Manufacturing Company Model "Yellow" or approved equal.

2.03 WIRE AND CABLE

A. Materials

1. All wiring shall be stranded or solid copper wire of the AWG wire size and color shown on the Drawings.
2. Wire for bonded joints shall be single conductor, stranded copper with high molecular weight polyethylene (HMWPE) insulation (black). Wire size shall be AWG No. 2 for piping larger than 36" and AWG No. 4 for piping 36" and smaller.
3. Wire for test stations shall be single conductor, solid copper wire with 600-volt THWN or HMWPE insulation (colors, size and insulation as shown on details on Drawings).
4. Wire for anode header cable shall be AWG No. 8 single conductor, stranded copper with high molecular weight polyethylene (HMWPE) insulation (black).

2.04 THERMITE WELDING EQUIPMENT

A. Approved Manufacturers:

1. Erico Products Inc., Cleveland, OH: Cadweld.
2. Continental Industries, Inc., Tulsa, OK: Thermoweld.

- ### B. Materials:
- Mold, weld metal, other material and equipment per manufacturer's recommendations for particular pipe/cable material and size. Only material and equipment from same manufacturer is allowed. Adapter sleeves shall be utilized for all thermite welds.

2.05 THERMITE WELD COATING MATERIALS

A. Manufacturers:

1. Weld Caps: Royston Laboratories Division, Model Handy-Cap, or approved equal.
2. Primer: Royston Laboratories Division, Roybond 747 Primer, or approved equal

- ### B. Materials:
- Thermite welds shall be coated with a prefabricated assembly specially designed for covering cathodic protection wire connections to piping and fittings. The prefabricated assembly shall consist of the following components:
1. Top plastic sheet formed with an igloo shaped dome and entry tunnel for the lead wire
 2. A special elastomeric compound in the plastic dome firm enough to resist flow at normally encountered application and operating temperatures, but soft enough to mold itself around and completely cover the irregular welded profile
 3. A double row of parallel, flexible serrations on either side of the dome to assist with conforming around small diameter pipe
 4. A base of black un-backed elastomeric tape with exceptional adhesive properties for bonding firmly to a surface when used with the appropriate primer

2.06 EXTERNAL COATING FOR MECHANICAL JOINTS AND COUPLINGS

A. General Requirements

1. All coatings used on project shall be from same manufacturer and as specified herein, unless otherwise approved by the Engineer prior to bidding. All products comprising of the completed coating system shall be compatible and the same products shall be used throughout the project.

B. Field Applied Heat Shrink Sleeves – Mechanical Joints and Couplings

1. Approved Manufacturers: CANUSA, The Woodlands, Texas

2. Materials: High performance cross-linked polyolefin wraparound shrink sleeve and closure seal.

2.07 DIELECTRIC COATING

- A. Approved Manufacturers:
 1. Royston Company, Pittsburgh, PA: Roskote A938
 2. Carboline, Pittsburgh, PA: Bitumastic No. 50
- B. Materials: The field-applied external coating shall be a fast drying (within 2 hours) cold applied mastic with high electrical resistivity (2.12×10^{13} ohms-cm) and 58.6% solids by volume. Coating system shall include compatible primer, as required by manufacturer. The external coating shall be applied as follows:
 1. Harnesses, tie rods, saddles, iron and steel anchors, and other connecting hardware.
 2. Pipe embedded in concrete anchor blocks or otherwise in contact with concrete, extending through concrete, and adjacent 6 inches in both directions.

2.08 WIRE CONNECTORS & TERMINATIONS

- A. Terminal Lugs
 1. Approved Manufacturers: Thomas and Betts Corporation, Raritan, NJ: Series 54100 and Model C10-14.
 2. Materials: One-hole, compression terminal lugs for 0.25-inch bolt size.
- B. Butt Splices
 1. Approved Manufacturers: Thomas and Betts Corporation, Raritan, NJ: Series 5450 and Model 210.
 2. Materials: Non-insulated type.

2.09 ELECTRICAL TAPE

- A. Vinyl Plastic
 1. Approved Manufacturers: 3M Company, St. Paul, MN: Scotch 88, or approved equal.
- B. Rubber Splicing
 1. Approved Manufacturers: 3M Company, St. Paul, MN: Scotch 130C, or approved equal.

2.10 FIELD TEST EQUIPMENT AND CALIBRATION SHEETS

- A. Field test equipment and calibration sheets shall be as determined by Contractor to meet specific requirements. All electrical instruments must bear evidence of calibration within 1 year of testing.

2.11 UTILITY WARNING TAPE

- A. Approved Manufacturers:
 1. Allen Systems, Houston, TX: Detectatape.
 2. Lineguard, Inc., Wheaton, IL: Lineguard Super Tuff III.
- B. Materials: Minimum 3 inch wide detectable warning tape, red or yellow in color, marked "Caution Cathodic Protection Cable Buried Below" at maximum intervals of 36 inches.

2.12 TEST STATION CONCRETE

- A. Materials: Ready-mix concrete conforming to ASTM C94. Minimum allowable 28-day compressive field strength shall be 3,000 psi (Class A3) when cured and tested in conformance with ASTM C31 and ASTM C39. Portland cement shall be Type 1.

2.13 SOLDER

- A. Materials: 0.062 inch diameter 60/40 Solder with 3.5 percent type RMA rosin core.

2.14 POLYETHYLENE ENCASEMENT

See Section 02510 – Ductile Iron Pipe.

2.15 MAGNESIUM ANODES

- A. Approved manufacturers:
 - 1. Stuart Steel Protection Company
 - 2. Corrpro

- B. Materials
 - 1. Each anode shall have the following nominal weight and dimensions:
 - a. 32 lb.- 21 inches long and D-shaped (5 inches by 6 inches by 4.5 inches)
 - b. Composition of anode
 - i. Aluminum 0.010% maximum
 - ii. Manganese 0.50 to 1.3%
 - iii. Copper 0.02% maximum
 - iv. Nickel 0.001% maximum
 - v. Zinc 0.05% maximum
 - vi. Iron 0.03% maximum
 - vii. Silicon 0.05% maximum
 - viii. Other 0.05% each or 0.030% maximum total
 - ix. Magnesium remainder
 - c. Anode backfill
 - i. Hydrated Gypsum 75%
 - ii. Bentonite 20%
 - iii. Sodium Sulfate 5%
 - d. Anode Lead Wire
 - i. Minimum of 10 feet of AWG No. 12 solid copper wire with TW insulation (black) shall be attached to anode. Wire anode attachment shall be by silver solder and sealed to prevent a moisture penetration.

2.16 ELECTRICAL SEPARATOR

- A. Stuart Rock Stop

- B. Approved Manufacturer:
 - 1. Stuart Steel Protection Corporation

2.17 INSULATING FLANGES

- A. Materials:
 - 1. Insulating Gasket: Type "E" Neoprene-faced Phenolic. Machined to match particular pipe material being used. Inside diameter to be 3/32 inch greater than the nominal inside pipe diameter.

2. Insulating Sleeves: G-10 Epoxy/Glass
3. Insulating Washers: G-10 Epoxy/Glass. Provide two washers for each bolt.
4. Steel Washers: 1/8 inch thick plated hot rolled steel. Provide two washers for each bolt.

PART 3 EXECUTION

3.01 INSTALLATION

A. Handling of Pipe

1. At the project site, the pipe shall not be handled with metal chains, cables, unpadded tongs, forklifts or other equipment likely to cause damage to the pipe shop coating or score the pipe surface.
2. Storing the pipe shall be on padded 12-inch wide (minimum) skids or selected loamy or sand dirt berms, where possible. In urban areas, pipe shall be suspended on padded skids. Where skid chucks are used in contact with the pipe, they shall be padded with several layers of padding material. Padded chucks shall be placed such that pipe is nested on the skid rather than the chuck. The coated pipe shall not be laid on pavement without benefit of padding at contact points.
3. If cables or chains are used during transportation, they shall be properly padded with approved, suitable material as required to protect the pipe surface from damage while in transit. Use of a padded horizontal separator strip between successive rows of pipe is necessary to prevent damage to the pipe surface.
4. At all times during construction of the pipeline, the Contractor shall take every precaution to prevent damage to the protective shop coating and scoring of the pipe surface. No metal tools or heavy objects shall be permitted to come into contact unnecessarily with the pipe surface.

B. Thermite Welding: Attach test wires and bond cables to the piping by thermite welding.

1. General: All thermite welds shall be made as shown on the Drawings and in accordance with the manufacturer's recommendations, using the proper combination of equipment for the pipe and wire size being welded. All welding materials and equipment shall be the product of a single manufacturer.
2. Area Preparation: Assure that the area where the attachment is to be made is absolutely dry. Remove mill coating, dirt, grime and grease from the pipe or fitting surface at the weld location by wire brushing or by the use of suitable safety solvents. Clean an area (two inches square) of the pipe or fitting surface at the weld location to a bright shiny surface as found in standard SPC-SP11. This standard covers the requirements for power tool cleaning to produce a bare metal surface and to retain or produce a minimum 25 micrometer (1.0 mil) surface profile free of all serious pits and flaws.
3. Cable Preparation: Prepare the wire for welding by assuring that the cable is absolutely dry. The cable shall be free of dirt, grease and other foreign products. Cut the cable in such a way as to avoid flattening or forcing out of round. To prevent deformation of the cable, cut the cable with cable cutters. Remove the insulation in a manner that will avoid damage to strands. Install adapter sleeves for all bonds and test wires in accordance with the manufacturer's recommendations prior to welding. Either prefabricated factory sleeved joint bonds or bond wire with formed sleeves made in the field is acceptable. Hold the cable at an approximate 30-degree angle to the pipe surface when welding.
4. Installation: Install thermite welds in accordance with the manufacturers written instructions. Deliver packaged weld charges to job site in new, unopened dry containers. Replace completed welds having burnt wire strands and wire strands not completely covered with weldment.

5. Testing: When the weld has cooled, remove the weld slag and test the weldment for strength by striking a sharp blow with a two pound hammer while pulling firmly on the wire in direction parallel to pipe. Replace unsound welds and retest weldments.
 - a. Documentation: Record adequacy of each bond cable and test wire weld based on the above procedure and visual inspection before and after coating weld area. Data recorded for each bond cable and test wire to include date of inspection, name of inspection personnel, pipeline station number, quantity and gauge of wire installed, and simple statement (e.g. "satisfactory") regarding proper installation. Provide field sketches where tabular data alone is not sufficient to document pipe alignment and bonding configuration.
 6. Cleaning and Replacing Molds: Thoroughly clean mold and mold covers after completion of each weld to assure that no slag will penetrate into the next weld. Replace molds periodically and where there is pitting or other wear conditions.
 7. Coating Thermite Welds: After soundness of the weld has been verified, thoroughly clean with a stiff wire brush and coat with an elastomeric cap. The elastomeric cap shall extend on all four sides beyond the cleaned area onto the pipe surface. Apply primer over the entire weld area and over the entire area where the elastomeric cap will be placed. Allow primer to dry. Push the dome of the prefabricated cap containing elastomeric material firmly into weld area. Lift the wire away from the pipe and apply the elastomeric material completely around and underneath the wire. Push the wire back down on the pipe.
- C. Bonded Joints: Install bond cables across each carrier pipe joint as indicated on the Drawings, using the thermite weld process.
- D. Magnesium Anode Lead Wire Splices, Wire Connectors and Terminations:
1. Magnesium Anode Lead to Header Cable Splices: Splice the AWG No. 12 solid copper wire supplied with the anode to an AWG No 8 HMWPE stranded copper cable through the use of a compression connector as shown. Tape the splice with three layers of high voltage rubber splicing tape (50% overlap), followed by three layers of vinyl electrical tape (50% overlap).
 2. Terminal Board Connectors: Crimp and solder each terminal box wire to a one-hole terminal lug. Clean and dry wire and lug connector before soldering.
 3. Wire Splicing: When wire splicing is required, use butt splice connector crimped, soldered, and insulated. Insulate splices by spirally wrapping (minimum 50% overlap with three layers of rubber splicing electrical tape and three layers of vinyl plastic electrical tape. Coat taped splice with electrical coating compound.
 4. General: No splices allowed in individual anode wires, joint bonds, and pipe wires.
- E. Magnesium Anodes:
1. Positioning: Horizontally or vertically to suit field conditions, with closest part of anode a minimum of 1 foot from main at or below elevation shown on Drawings. Spacing between anodes install in a group is 20 feet unless noted otherwise.
 2. Installation in Rock Areas: If solid rock is encountered at a depth which will not accommodate normal installation, investigate immediate proximity to determine if anode can be installed at specified depth at another location in the immediate area.
 3. Backfill: Use soil free from rock and organic material. Do not use sand or clay. After anode is covered with 1 foot of soil, pour 5 gallons of water over covered portion of anode.
 4. Wiring: Unless noted otherwise, connect grouped anodes through an AWG No. 8-stranded copper header cable. Terminate each end of anode cable in designated test stations with only splicing of cable at anode wire attachments. Anode header cables shall be buried a minimum of 3 feet below grade. Install warning tape one foot above anode cable. Handle wire with care.
 5. Documentation: Include location and orientation of each anode on Record Drawings.
- F. Test Stations: Includes terminal box, concrete pad, wire leads, utility warning tape and monitoring equipment.

1. General: Type of test station; number, size and color of wires and wire routing are shown on the Drawings. Unless otherwise noted or approved by the Engineer or Owner, test stations for pipelines buried under pavement shall be located outside paving limits. Test stations shall be sufficiently set back from vehicle traffic lanes so that they can be accessed for maintenance without extensive traffic control or other special safety precautions.
 2. Wire Routing: Install test and monitoring equipment wires in a wiring harness arrangement routed along the bottom of the pipe trench where practical. Form harness by taping wires together at intervals of 10 feet. Install wires leaving the pipe trench in 2" PVC conduit when terminal box is not installed over sewer main.
 3. Utility Warning Tape: Install 1 foot above PVC conduit.
 4. Concrete Pad:
 - a. Concrete Pad: Provide for each flush mount test station if the test station is installed out of paving or concrete sidewalk. Non-reinforced concrete pad formed around test station shall be 24 inches by 24 inches by 8 inches sloped away from terminal box.
 - b. Survey Marker: Mount flush with concrete during pad construction.
- G. Clearance of Piping to Other Structures
1. 12 inches of natural clearance shall be maintained between the piping and other structures, where possible. When 12 inches of clearance cannot be maintained, install a high density (Rock Stop) electrical separator secured with non-metallic tape to the sewer main and between the foreign structures.
- H. Concrete Buttresses, Support Blocks, Thrust Anchors
1. Position reinforcing rods used in the construction of support blocks, anchor blocks and other concrete structures so that they are not in contact with the piping. Maintain a minimum 2 inches of spacing between all reinforcing steel and the pipe and any pipe anchors.
 2. When placing concrete in direct contact with ductile iron piping, apply the Dielectric coating to the external surface of the ductile iron piping prior to placing the concrete. Clean all dirt, moisture, oil, grease, and other contaminants from the piping surface. Thoroughly mix the Dielectric coating and apply a coat of approximately 12 mils of coating to the piping surface. Coating shall be applied to all pipe areas coming in contact with concrete and extend 6 inches beyond concrete in both directions. Allow the coating to dry to touch (approximately 20 minutes) and apply a second coat of mastic of approximately 12 mils in thickness. Allow drying before placing the concrete.
- I. Insulated Flanges: Unless noted otherwise, install with a test station and two test wires attached to pipe on each side of flange.
1. Preparation: Clean mud, dirt, grease, oil and other contaminants from flange surfaces. Check flange face and bolt hole tolerances and verify clearances prior to installing insulating materials.
 2. Installation: Install insulated flange gasket, sleeves and washers under clean and dry conditions in accordance with manufacturer's written instructions. Two insulating washers required for each bolt (one for each side of flange). Properly torque bolts per insulating material manufacturer's instructions to avoid damage to insulating components and otherwise ensure electrical separation between flange faces and between each bolt and each flange. Do not use conductive grease or other material to facilitate flange assembly which could compromise electrical integrity of insulating materials.
 3. Initial Testing: After assembly, directly measure electrical resistance between each bolt and one flange using an ohm meter or other approved low voltage resistance meter. Resistances less than 10 megohm are not acceptable and require insulator replacement, cleaning and drying of insulator surfaces, and/or other corrective action. If any bolt fails the 10 megohm minimum resistance requirements, all bolts must be retested after corrections are made. Tests shall also be performed across the insulating flange to

assure that the central gasket is providing effective insulation between the flanged faces prior to coating.

4. External Coating: Coat buried insulating flanges with approved heat shrink sleeve. Surface preparation and coating application shall be as specified by manufacturer, including use of filler material to provide smooth contour around bolts and from transition between pipe and flange.
5. Final Testing before Backfilling: A final test of the insulating flange shall be made from the attached test wires prior to backfilling. Tests shall be repeated from the insulating flange test wires after backfilling and after the test wires have been brought to grade.

3.02 TESTS

- A. General: The Engineer or the Owner's Inspector will witness testing at his option and discretion.
 1. Test Data Forms: Record test data in a uniform format pre-approved by the Engineer. Include test data, personnel, and instrumentation used on each sheet.
 2. Testing Summary:
 - a. Pre-Backfill Tests
 1. Bonded joint and test wire integrity
 - b. Post-Backfill Tests
 1. Pipe continuity test
 2. Pipe-to-soil DC potential measurements
 3. Anode current measurements from test station shunts
 - c. Improper materials or installation determined by Contractor performed tests, and/or tests performed by the Engineer, shall be corrected by the Contractor.
 3. Schedule
 - a. Pre-Backfill Tests: Complete as work progresses.
 - b. Post-Backfill Tests: Start no sooner than 2 months before scheduled application for Beneficial Use.
 - c. Test Report: Letter of Compliance; Record Drawings: Submit no later than 10 working days prior to final inspection.
 4. Test Report
 - a. Raw test data for all pre-backfill and post-backfill tests.
 - b. Test set-ups and schematics.
 - c. Summary tabulations and theoretical calculations.
 - d. Letter of Compliance.
 - e. Record Drawings.
- B. Pre-Backfill Test Procedures
 1. Bonded joint and test wire integrity tests
 - a. Conduct visual inspection and hammer test including required documentation.
 2. Test wire integrity tests
 3. Test electrical effectiveness of each buried insulating flange after installation
 4. Perform tests for completed insulators by a) use of a high frequency isolation tester manufactured specifically for this purpose, and by b) measuring electrical potential across the fitting after application of a direct test current to the pipe on one side of the fitting of no less than 1 ampere is applied. Documented data for test b) shall include all potentials and applied test current.
 5. Acceptance Criteria:
 - a. High frequency isolation tester: Acceptable
 - b. Electrical potential/applied current: Apply test current to one side of the insulating fitting; a positive potential shift on the side of the flange where current is applied, and negative potential shift on the side of the flange opposite of where the current is applied indicates that the insulator is effective.

C. Post-Backfill Test Procedures

1. Pipe Continuity Tests

- a. Measure and record longitudinal resistance of pipe between consecutive test stations. Determine resistance using Ohm's Law by impressing a direct test current across pipe span and measuring resultant voltage drop across same span. Use of temporary test points at locations other than test stations require approval by the Engineer.
- b. Documentation: Include applied test current, measured voltage before application of current, with current applied and immediately after interrupting test current, calculated resistance and corresponding theoretical resistance (Paragraph c. below) in test report.
- c. Acceptance Criteria: Maximum acceptable span resistance - 110% of the sum of:
 - i. Number of pipe joints multiplied by theoretical resistance of a joint bond, determined by number of bond wires per joint and wire gauge.
 - ii. Length of pipe multiplied by theoretical resistance per unit length; determined by pipe diameter, wall thickness and resistivity.

2. Pipe-to-Soil Potential Measurements

- a. Record at all test stations.
- b. Collect using a temporary copper/copper sulfate reference electrode placed on grade within one foot of test station.
- c. Collect at all locations prior to connecting anodes at test stations, and then after anodes have been connected at all test stations for a minimum of 2 hours.

3. Anode Potential and Current Measurements:

- a. Measure and record open-circuit potential between each anode cable at each test station and a temporary copper/copper sulfate reference electrode placed on grade within one foot of test station. Collect open circuit potential data with no other influencing anodes connected to main.
- b. Measure and record anode current at each test station using permanently installed current measuring shunt. Document shunt voltage drop, shunt resistance, and calculated current.
- c. Acceptance Criteria:
 - 1) Open-Circuit Potential: Magnitude 1.6 volts or greater.
 - 2) Anode Current: Minimum 0.02 ampere per anode, adjusted to account for number of anodes included in circuit at any given location (e.g. 15 anodes - minimum 0.30 ampere).

4. Insulated Joint Effectiveness Tests: Test each joint. Procedures and acceptance criteria in accordance with pre-backfill insulated joint effectiveness tests.

END OF SECTION 01331

SECTION 01710

PROJECT CLEANUP

PART 1 - GENERAL

1.01 GENERAL

- A. Before the work will be considered as having been completed, the Contractor shall clean the site and remove all evidence of construction activities and stabilize and restore all disturbed areas.

1.02 CLEANUP

- A. Construction site cleanup shall consist of the removal of all mud, oil, grease, dust, trash, scrap, debris, and surplus excavated material.
- B. No items shall be left or discarded elsewhere on the site or on adjoining private property. Items that are to be discarded shall be removed to authorized public landfills.

1.03 RESTORATION AND STABILIZATION

- A. All areas disturbed by the Contractor's operations, including storage and stockpiling areas, access roads, stream crossing sites and areas within right-of-way or acquired construction easement shall be restored and stabilized as specified.
- B. Final restoration and stabilization including fine grading, landscaping, seeding and paving shall proceed immediately after construction activity is completed in a given area. The Contractor shall dismantle and remove all temporary construction facilities and leave the site in a neat and orderly condition.
- C. Preserve and maintain in their original condition all public and private signs, markers, guard rails, and public fences. If authorized to do so, remove such conflicting facilities, preserve, store and protect them and erect upon completion of the construction. Replace damaged items at no cost to the Owner.
- D. Protect and guard trees, repair damaged trees or replace trees damaged beyond repair as specified elsewhere in these Specifications.
- E. Reseed damaged lawn areas and seed areas used for access roads, parking and storage as specified elsewhere in these Specifications.
- F. Restore gravel surfaces and shoulders to original condition. If existing gravel is contaminated by foreign material remove and replace the gravel. Materials and methods of construction shall be in accordance with jurisdictional requirements required by the Engineer and applicable permits issued for the work. Areas adjacent to shoulders, if left unstable by construction, shall be stabilized with gravel.
- G. Pavement, curbs, and other paved areas shall be restored in accordance with the requirements of these Specifications and/or as required by the Engineer.

1.04 DISPOSAL OF WASTE MATERIALS

- A. Construction waste material shall be disposed of in authorized disposal areas, including municipal facilities if available.
- B. Waste material disposed of in an unauthorized area shall be removed by the Contractor and the area restored to its original condition, at no cost to the Owner.

1.05 REMOVAL OF CONDEMNED MATERIAL

- A. Material brought upon the site which has been determined by the Engineer to be unsuitable or not in conformity with the Specifications shall be promptly removed from the site by the Contractor.
- B. If the Contractor fails to remove condemned material from the site within 72 hours after receipt of notice from the Engineer, the Engineer may cause the condemned material to be removed and the cost of such removal deducted from monies due the Contractor.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 02260

EXCAVATION SUPPORT/PROTECTION SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES:

- A. Shoring and Bracing
- B. Trench Shields (Boxes)

1.02 REFERENCES

- A. ASTM D245 Establishing Structural Grades and Related Allowable Properties for Visually Graded Lumber.
- B. American Wood Preservers Institute C2.
- C. Occupational Safety and Health Administration (OSHA)
Occupational Safety and Health Standards - Excavations; Final Rule 29CFR Part A26.

1.04 SUBMITTALS

- A. Submit shop drawings and material certificates of compliance in accordance with Section 105.IV of the General Provisions.
- B. Design Data:
 - 1. Submit design drawings of trench and excavation support/protection systems (steel sheeting, etc.) and pipe support system(s) to be used on the Project. Drawings must be sealed and signed by a Professional Engineer registered in the Commonwealth of Virginia.
 - 2. Trench Shields: Submit design or approval of trench shields by registered Professional Engineer.
 - a. Refer to OSHA Standard for design requirements.

1.05 REGULATORY REQUIREMENTS

- A. OSHA: Comply with OSHA regulations for excavation safety.
- B. Virginia Department of Labor and Industry: Comply with requirements of Virginia Department of Labor for Excavation Safety.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Timber and Lumber: Timber and lumber shall meet the requirements of ASTM D245 and the following:
 - 1. General: Timber and lumber shall be free from shakes, waness, black and unsound knots and decay.

2. Untreated Lumber: Timber and lumber for shoring and bracing shall be new pine, Douglas fir, or spruce unless otherwise shown or specified. Timber and lumber for decking and supports shall be hard yellow pine. No secondhand timber or lumber shall be used where strength and appearance are considerations.
 3. Treated Lumber: Treated timber and lumber shall be well seasoned No. 1 southern yellow pine or Douglas fir, reasonably free of knots, splits, seasoning checks, pitch pockets and streaks, wormholes and other defects.
 - a. Timber and lumber shall be treated with Grade One coal-tar wood preserving oil by the empty cell process, in conformity with the requirements of the American Wood Preservers Institute C2.
- B. Temporary Steel Sheeting: Temporary Steel sheet piling and bracing of equal or greater strength than timber and lumber as specified above may be used for excavation supports but is considered incidental construction.

2.02 EQUIPMENT

- A. Trench Shields: Trench Shields shall meet all applicable OSHA Requirements for such units.

PART 3 EXECUTION

3.01 INSTALLATION

- A. General: Shore and brace excavations as required by law and all applicable regulations or where conditions dictate to prevent shifting of material or damage to structures or adjacent property, and to avoid delays to the Work.
- B. Bracing: Arrange bracing to avoid placing strain on portions of the completed Work until the shoring and bracing is to be removed.
- C. Trench Shields: Trench Shields shall be installed in accordance with manufacturer's instructions.

3.02 REMOVAL

- A. Shoring and bracing: Remove shoring and bracing as excavation is backfilled in a manner which avoids caving of the bank, damage to the Work, and disturbance to adjacent areas, pipelines, and other under-ground utilities or structures.
1. Voids: Fill voids left by withdrawal of the shoring by jetting, ramming or as otherwise directed by the Owner or Engineer.

END OF SECTION 02260

SECTION 02315

EXCAVATING, BACKFILLING, AND COMPACTING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Excavating Trenches for Pipes, Structures and Appurtenant Facilities
 - 2. Backfilling and Compacting

1.02 MEASUREMENT AND PAYMENT

- A. Refer to Section 01200 – Measurement and Payment Procedures
- B. All excavation performed under this contract shall be unclassified excavation, regardless of whether in paved or unpaved areas, or the material encountered below ground surface.

1.03 REFERENCES

- A. Land Use Permit Manual. Virginia Department of Transportation.
- B. Road and Bridge Specifications. Virginia Department of Transportation.
- C. Virginia Department of Transportation Drainage Manual.
- D. ASTM D698 - Test Methods for Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb. Hammer and 12-inch Drop.
- E. Manual of Accident Prevention in Construction. Associated General Contractors of America.
- F. Occupational Safety and Health Standards-Excavation; Final Rule 29 CFR Part 1926, OSHA.
- G. City of City of Suffolk Public Facilities Manual.

1.04 SUBMITTALS

- A. Submit shop drawings and material certificates of compliance in accordance with Section 01330 – Submittals.
- B. Materials and Certifications:
 - 1. Select Fill/Bedding: Submit letter of certification and list of material composition and properties from each supplier of select fill, suitable fill, undercut excavation backfill, and pipe bedding material.
 - 2. Compaction Test Reports: Submit reports for each location of field compaction test. Reports shall include results of field density tests, moisture content, and degree of compaction.
- C. Geotextile Fabric

1.05 DEFINITIONS

- A. Utility: Buried pipe and appurtenances including structures, valves, supports, foundations, thrust restraints, conduit, or cable, surface features such as swales and ditches, and overhead wires or cables including their supports.
- B. Earth: The softer materials of the outer surface of the earth. The basic constituents are the products of rock disintegration, glaciation, and erosion, consisting of boulders, cobbles, pebbles, sand, silt, and clay.
- C. Rock: The hard, firm and stable parts of the earth's crust which shall include all materials which cannot be removed by excavation equipment of appropriate size and power for the diameter pipe being installed and requires blasting or manual or mechanical barring, wedging or hammering for removal from their original beds. Specifically included are ledge, bedrock, boulders, cement, grout, masonry or concrete of any size.
- D. Unclassified Excavation: Consists of the excavation of and proper disposal of any type of material that is encountered during the progress of the work. Materials included in this definition include but are not limited to: earth, rock, concrete, abandoned utilities (whether shown on the drawings or not), and asphalt or concrete pavement sections regardless of depth.

1.06 FIELD MEASUREMENTS

- A. Bench Marks: Verify that survey bench marks and intended elevations for the Work are as shown on the Drawings. Refer to Section 01720 – Field Engineering for additional requirements.

1.07 TREE CUTTING REQUIREMENTS

- A. Establish Clearing Limits: The clearing limits shall be as defined on the Drawings. All trees within the clearing limits shall be removed (including stumps) unless denoted to be saved (via tree protection). Prior to tree removal or beginning clearing operations, the Contractor shall identify the clearing limits for the Project using yellow ribbon to designate the boundaries.
 - 1. Specific trees to be saved within and adjacent to the clearing limits shall be flagged.
 - 2. Clearing limits and trees to be saved will be reviewed at the site by the Owner or Engineer.
 - 3. Trees (up to 30 feet tall) located outside of the designated clearing limits, whose branches overhang within the limits of construction, shall be trimmed back by a certified nurseryman approved by the Owner.
- B. Root pruning procedures: root pruning shall be performed where excavation will occur within the drip line of trees designated to be saved. Root pruning may be accomplished with a rock saw, chain saw, hand pruning saw, sharpened trencher or vibratory plow, or a machine specifically designed for root pruning, as required to result in a smooth, flat truncation of the root. Where a trencher or vibratory plow is utilized, the blade or teeth must be sharpened prior to each start. The location of the cut is 6 inches outside the limits of excavation (trench side closest towards the protected tree) to ensure that all roots encountered in the trench are properly severed. Large roots encountered that cannot be severed with root pruning machinery are to be hand cut with a sharpened pruning or chain saw. Contractor shall not use

a backhoe or other similar equipment to cut tree roots.

- C. Authorization for Tree Removal: No tree shall be removed until Contractor has written approval from the Owner.
- D. Consequences for Unauthorized Tree Removal: At the discretion of the Owner, one of the following measures will be imposed as a remedy for each tree removed without prior approval.
 - 1. At his expense, Contractor shall plant minimum 10 foot tall replacement trees in quantities which equal the number of trees removed.
 - a. The species of replacement trees will be the same as the trees which were removed, or as directed by the Owner.

1.08 WORK REQUIREMENTS IN FEDERAL, STATE, OR CITY RIGHTS-OF-WAY

- A. Permits: Refer to Section 01410 - Regulatory Requirements, for permits obtained by the Owner. All other permits shall be obtained by the Contractor.
 - 1. The Contractor shall assume all responsibility for fulfilling any and all requirements specified in right-of-way permits.
 - 2. All applicable provisions in the City of Suffolk Public Facilities Manual and Virginia Department of Transportation (VDOT) as can apply to the type of Work shall apply.
 - 3. Work within the City of Suffolk right-of-way will be subject to inspection by representatives of the City.

1.09 WARRANTY

- A. The Contractor shall be responsible for correcting any settlement in backfill or pavement for a period of one year after completion of the Work.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils for Structural Fill Material: Soil Classification Groups GW, GP, SW, SP, and SM according to ASTM D 2487, or a combination of these groups consisting of sand or gravel containing less than 25 percent by weight of fines, having a liquid limit less than 20 and a plastic limit less than 6. The soil should be free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups fly ash and other coal combustion byproducts.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

2.02 FILL MATERIALS

- A. Select Fill: Select fill shall meet the following requirements:

1. 21A crushed stone conforming to VDOT specifications.
- B. Suitable Fill: Suitable fill material shall conform to the following requirements.
 1. Type I: Type I material shall consist of clean earth excavated from the trench containing no stone larger than $\frac{3}{4}$ inch across.
 2. Type II: Type II suitable material may be substituted for Type I suitable material, in the area from 12 inches above top of pipe to original grade. Type II material shall contain good earth and stone excavated from the trench.
 - a. Stone material contained in Type II suitable fill shall not exceed 4 inches across and shall be uniformly distributed.
 - b. Type II suitable material shall not consist of more than 50 percent stone by volume.
- C. Undercut Excavation Backfill shall meet the following requirements
 1. No. 57 Stone conforming to the VDOT specifications.

2.03 BEDDING MATERIALS

- A. Pipe bedding shall consist of No. 26 stone conforming to VDOT specifications unless otherwise specified.
- B. Manhole and structure bedding shall consist of No. 57 stone conforming to VDOT specifications unless otherwise specified.

2.04 GEOTEXTILE FABRIC

- A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 1. Survivability: Class 2; AASHTO M 288.
 2. Grab Tensile Strength: 200 lbf; ASTM D 4632.
 3. Tear Strength: 75 lbf; ASTM D 4533.
 4. Puncture Strength: 90 lbf; ASTM D 4833.
 5. Apparent Opening Size: No. 50 sieve, maximum; ASTM D 4751.
 6. Permittivity: 0.05 per second, minimum; ASTM D 4491.
 7. UV Stability: 70 percent after 500 hours' exposure; ASTM D 4355

PART 3 - EXECUTION

3.01 GENERAL

- A. Contractor is responsible for damage to all existing structures resulting from construction activities. Contractor shall restore property or structures damaged during construction within thirty (30) days of the date of damage.

3.02 PREPARATION

- A. Identify: Required lines, levels, contours, and datum.
- B. Document Existing Features: Prior to performing any clearing or excavation activities, all existing surface features, including signs, fences, mailboxes, landscaping vegetation or

structures, small trees, shrubs and other similar features, shall be recorded on preconstruction video. Video will be of sufficient quality to establish the existing conditions before excavating.

- C. Protect Existing Vegetation: Protect plant life, lawns, and other features remaining as a portion of final landscaping.
- D. Protect Existing Features: Protect bench marks, existing structures, fences, sidewalks, paving, mailboxes, gas line markers, curbs, and other similar features from excavation equipment and vehicular traffic.
- E. Clearing: The site of all open cuts and excavation shall be first cleared of trees, stumps, shrubs, underground and other obstructions prior to excavation.
 - 1. Clearing within easements and rights-of-way shall be limited to as shown on the Drawings or as directed by the Owner or Engineer.
 - 2. Remove and dispose of cleared materials and debris unless otherwise directed by the Owner or Engineer.
 - 3. Remove the top 6 to 12 inches of topsoil and stockpile for use in restoration of excavated areas.
- F. Excavation: All excavation shall be unclassified. Contractor shall perform excavation as necessary to complete the work.
- G. Dewatering: The contractor is advised that excavation below groundwater levels will be required to construct permanent work.
 - 1. The Contractor shall assume that all trench excavation will require dewatering to some extent, and that deep excavation for portions of the work will require extensive dewatering.
 - 2. Refer to the Boring Logs referenced by these Specifications for water levels encountered during the exploratory drilling program. Water levels shown on the Boring Logs indicate levels that existed on the date of the drilling. There is no assurance that groundwater levels shown will be representative of those which occur during construction
 - 3. The following factors shall be considered when planning dewatering systems for the required excavations:
 - a. Long-term dewatering of excavations for the construction of pipeline and appurtenant structures shall be performed as required.
 - b. In addition to the aggregate required for pipe bedding, the Contractor may use additional VDOT No. 57 coarse aggregate for dewatering for his own convenience with the approval of the Engineer at no additional cost to the Owner. No additional payment will be made for material for the purpose of dewatering.
 - 4. Dewatering Plan: Submit a dewatering plan for review by the Engineer prior to proceeding with any excavation work where groundwater may be encountered. The Contractor will be solely responsible for the adequacy of the dewatering plan.
 - 5. Equipment used for dewatering excavations will be as selected by the Contractor and as required by the dewatering plan. The Contractor shall provide additional or different equipment as groundwater conditions dictate. The Contractor shall provide sufficient backup equipment as necessary to prevent work interruptions or damage to work. In some areas it may be necessary or beneficial for the Contractor to dewater around-the-clock, 24-hours a day. In such case, the Contractor shall periodically check the dewatering pumps during the evening and nighttime hours when pipe laying is not in progress. Extra fuel and back-up equipment shall be available during the evening and nighttime hours so

- that dewatering is not interrupted.
6. Subsurface Exploration: The Contractor shall conduct supplementary subsurface exploration as necessary to define existing groundwater levels within the area of excavation.
 7. Environmental Controls:
 - a. Groundwater Discharge: All water pumped from well points or excavations shall be directed into sediment control devices prior to release into watercourses. Dewatering pumps shall NOT discharge directly to storm drains unless inlet protection is provided and as approved by an authorized regulatory representative.
 - b. Noise: Dewatering pumps shall be sound attenuated at 63 dBA 30 feet from pump.
 8. Install dewatering facilities and perform dewatering prior to initiating excavations in any area.
 9. Perform excavation in accordance with this Section.
 10. All groundwater inflows must be controlled at all times. Operate and maintain dewatering systems throughout the duration of the Contract.
 11. Groundwater level shall be maintained a minimum of 2 feet below the bottom of excavations, whenever possible.

3.03 WORK IN PUBLIC RIGHT-OF-WAY

- A. Length of Open Trenches: The maximum length of trench at any time, including backfill portion of same not then suitable for traffic, shall not exceed 200 feet. Trenches shall not be left open at the close of the work day as required by the City of Suffolk.
- B. Repair of Damage: When pavement edge or shoulder is damaged due to diversions of traffic away from the pipe laying operation, repairs shall be made as directed.
- C. Open Cut Requirements: Wherever pavement is permitted to be cut, not over one-half of the width shall be disturbed at one time. For crossings, the first opening shall be completely restored to satisfactory travel conditions before the second half is opened. Where the pavement is disturbed, or deemed weakened, it shall be restored or replaced as directed in its entirety, or such portion or portions as deemed necessary.
- D. Stockpiling Excavated Materials: No excavated material shall be placed on the pavement, without written permission. When so permitted, protect pavement with a 1-inch layer of sand or approved substitute material at no additional cost to the Owner. The pavement shall be satisfactorily cleaned by an approved method.
- E. Equipment Restrictions: No cleated equipment shall be used on pavement. Where track equipment must enter paved areas, protect pavement with a sufficient layer of sand or approved substitute material at no additional cost to the Owner.
- F. Traffic Maintenance: Refer to Section 01570 – Traffic Regulation and the Contract Drawings.
- G. Correction of Hazardous Situations: The Contractor shall immediately correct any situation which may arise which the Owner or Engineer deems hazardous to the traveling public.
- H. Temporary Drainage Requirement: Maintain all drainage facilities in accordance with Section 01500 – Construction Facilities any Temporary Controls.

- I. Dust Control: The Contractor shall ensure that dusty conditions are controlled in accordance with Section 01500 – Construction Facilities any Temporary Controls.
- J. Pavement Restoration: Refer to Section 02700 – Paving and Surfacing for pavement restoration requirements.

3.04 EARTH EXCAVATION

- A. Shaping and Trimming: Excavate trenches to the widths and depths specified below, except where indicated otherwise.
 - 1. Trench width at bottom of pipe:

<u>Pipe Type</u>	<u>Trench Width (Inches)</u>
DIP	Outside Diameter + 48

- 2. Earth Trench: Excavate trench to a minimum of 6 inches below the bottom of pipe and replace with 6 inches of pipe bedding material.
 - 3. Pipe bedding: Grade and align top of pipe bedding to provide bearing for the full length of the pipe barrel. Provide bell holes for the proper assembly of pipe joints.
- B. Undercut Excavation: If unsuitable bearing materials are encountered at the specified elevation, or if additional depth is required for other reasons, no additional payment will be made unless such further excavation is carried to the depth requested by the Contractor and approved in writing by the Owner or Engineer. It is the responsibility in the first instance of the Contractor to evaluate the suitability of bearing materials and to notify the Engineer of any irregularity or unsuitability. Notwithstanding the foregoing, in the event the Engineer determines the bearing materials in any area to be unsuitable, with or without the concurrence of the Contractor, the Contractor shall promptly follow the direction of the Engineer in addressing such condition. Where additional excavation has been ordered and approved, the Contractor shall replace the removed material with VDOT No. 57 stone as directed by the Owner or Engineer.
- C. Unauthorized Excavation: Wherever the excavation is carried beyond or below the lines and grades given by the Engineer, except as specified above, all such excavated space shall be refilled with such material and in such manner as may be directed in order to ensure the stability of the various structures. Beneath all structures, space excavated without Owner permission shall be refilled by the Contractor at his own expense, with select fill materials, as ordered by the Owner or Engineer.
- D. Disposal of Material: Top soil suitable for final grading shall be stored on the site separately from other excavated material. Other surplus excavated material unsuitable for backfilling or in excess of that required for constructing fills and embankments as shown on the Drawings, shall be removed from the site by the Contractor at no additional expense to the Owner.
- E. Excavation Support systems: Refer to the provisions of Section 02260 – Excavation Support System for requirements.
- F. Removal of Water: Refer to the provisions of 01500 – Construction Facilities any Temporary Controls for requirements.

3.05 BACKFILLING

- A. Pipe Trenches: Backfill to original grade or to such other grades as shown or directed by the Owner or Engineer, in accordance with the requirements of the trench details on the Contract Drawings, and as described herein.
- B. Bedding
 - 1. Bed pipe, manholes, and structures as shown on the contract drawings. This material shall be placed in layers approximately 6-inches thick (before compaction), each layer being thoroughly tamped and compacted in place to a minimum of 95% of maximum dry density in accordance with ASTM D698.
- C. Backfilling in Trench and Around Structures:
 - 1. For unpaved areas:
 - a. Place Type I Suitable Fill from the top of pipe bedding to 12-inches above the crown on the pipeline. This material shall be placed in layers approximately 6-inches thick, each layer being thoroughly tamped and compacted in place to a minimum of 95% of maximum dry density in accordance with ASTM D698. Then place Type I or II Suitable Fill from the 12-inches above the pipeline to the bottom of topsoil in 6-inch layers, each layer being thoroughly tamped and compacted in place to a minimum of 85% of maximum dry density in accordance with ASTM D698. Backfill for manhole and structures shall be compacted to a minimum 95% maximum dry density in accordance with ASTM D698.
 - 2. For paved areas:
 - a. Place Select Fill from the top of pipe bedding to bottom of pavement section in accordance with the Contract Drawings.
 - b. Backfill shall be compacted to a minimum of 95% of maximum dry density.
 - 3. For private roads, driveways, parking area, sidewalks and trails the following requirements apply:
 - 1) Backfill from the top of pipe bedding to the base of the paved surface with Select Fill.
 - 2) Backfill shall be compacted to a minimum of 95% of maximum dry density.
 - 4. Backfill the remainder of the trench in accordance with the trench details on the contract drawings.
 - 5. Remove lumber, rubbish, braces and refuse from behind walls prior to starting backfill operation.
- D. Select Fill for pipe installation shall be at no additional cost to the owner.
- E. Compaction testing, by an independent testing laboratory approved by the Owner, shall be paid for by the Contractor, at no additional cost to the project.
 - 1. One compaction test shall be made for each 500 linear feet of pipeline installed. Test location and depth will be as directed by the Owner or Engineer. Testing shall be continued along the backfill benching so as not to delay pipe laying activities.

3.06 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.

2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
1. Walks: Plus or minus 1 inch.

3.07 RESTORATION

- A. General: The Contractor shall be responsible for maintenance and careful removal of signs, fences, mailboxes, gas line markers, small trees, shrubs and other similar features. Temporary restoration of these items, if needed, shall be accomplished within 24 hours. All items covered by this section shall be restored or replaced in kind by the Contractor immediately upon completion of pipe installation in the affected area.
- B. Complete finish grading and restoration of excavated areas in accordance with Section 02920 – Lawns and Grasses and the Drawings.
- C. Pavement: Refer to the provisions of Section 02700 – Paving and Surfacing.

END OF SECTION

NO TEXT THIS PAGE

SECTION 02370

EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Erosion and Sediment Controls: This work consists of temporary methods to control water pollution such as berms, dikes, dams, sediment basins, crushed stone, gravel, mulches, grasses, straw bales, silt fence and other erosion control devices as indicated on the Drawings.
2. Riprap.
3. Silt Fence.
4. Geotextile Fabric.

1.02 REFERENCES

- A. Virginia Erosion and Sediment Control Handbook, latest edition.
- B. Virginia Department of Transportation Road and Bridge Specifications.

1.03 SUBMITTALS

- A. Submit shop drawings and material certificates of compliance in accordance with Section 105.IV of the General Provisions.

1.04 REGULATORY REQUIREMENTS

- A. Erosion and Sediment Controls: Erosion controls shall be as indicated on the Drawings and shall satisfy the governing standards of the City of Norfolk or Virginia Erosion and Sediment Control Handbook, whichever is more stringent.

PART 2 PRODUCTS

2.01 MATERIALS

- A. General: All products and materials shall comply with the "Erosion and Sediment Control Handbook.
- B. Riprap:
 1. Riprap shall be in conformance with VDOT Road and Bridge Specifications, Sections 204 and 414, for Dry Riprap Class I, as indicated on the drawings.
 2. Riprap bedding shall be crushed stone, minimum Grade B conforming to VDOT Road and Bridge Specifications, Section 203, 204, and 414. Stone size shall conform with Drawings.
 3. All stone shall be sound, durable and free from seams, cracks or other structural defects.
- C. Filter Fabric (Geotextile): Filter fabric used for silt fence and geotextile underliner shall be in conformance with Section 245 of the VDOT Road and Bridge Specifications.

PART 3 EXECUTION

3.01 PREPARATION:

- A. Prior to commencing Work, a joint on-site inspection shall be held to review specific siltation control requirements. Participants should include representatives of the Contractor, the Owner, and the Engineer.
- B. Precautions: Take precautions to prevent the silting of streams or water impoundments during actual construction and periods when the Work may be temporarily suspended.
 - 1. Prevent construction activities from causing erosion to soil on the site and adjacent property. Initiate effective measures prior to the commencement of clearing, grading, excavating, or other operations that will disturb the natural protection.
- C. Work Schedule: Schedule Work to expose areas subject to erosion for the shortest possible time. Preserve natural vegetation to the greatest extent possible. Locate temporary storage and construction buildings and route construction traffic to minimize erosion. Provide temporary fast-growing ground cover or other suitable means as necessary to control runoff.

3.02 INSTALLATION

- A. Stockpiling Excavated Materials: Stockpile all excavated materials on the uphill side of the pipe trench when this practice is not contrary to safe requirements or equipment working room requirements.
- B. Protect Existing Vegetation: Retain and protect natural vegetation wherever feasible.
- C. Riprap Installation: Place riprap in the prepared area within 15 days after the backfill of the applicable trench section. Place riprap in such a manner as to produce a well-graded mass of rock with a minimal percentage of voids.
- D. Silt Fence: The Contractor shall install silt fence along each side of limits of clearing/ construction and where indicated otherwise on the drawings, and where directed by the Engineer.

3.03 PROTECTION

- A. Protection of Stockpiled Material: Any stockpiled material which will remain in place longer than 30 days shall be seeded for temporary vegetation and mulched with straw mulch. Where spoil is placed on the downhill side of the trench, it shall be back sloped to drain toward the trench. When dewatering the trench is necessary, the discharge hose must outlet in a stabilized area or a sediment basin. Maintain erosion control measures throughout the life of the contract.

3.04 RESTORATION

- A. Seed, mulch and fully restore all disturbed areas within 15 days after backfill of the applicable trench section. In no case shall a construction area be denuded for more than 60 days.

END OF SECTION

SECTION 02510

DUCTILE IRON (DIP) WATER MAINS AND APPURTENANCES

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope:

1. Contractor shall furnish all materials, labor, supervision, tools, equipment and incidentals required to furnish, deliver and install 36-inch diameter ductile iron pipe (DIP), fittings, specials, and accessories for the water pipeline as required by the Contract Documents and required to complete the Work.
2. It is the purpose of the Contract Documents to provide a complete and workable piping system. Miscellaneous fittings, specials, and accessories not specified in the Bid Form or the Contract Documents but necessary to complete the Work shall also be provided as a part of this Contract.

B. MEASUREMENT AND PAYMENT: Refer to Appendix D.

1.02 QUALITY ASSURANCE

A. Pipe Manufacturer Qualification: The Materials specified herein shall be manufactured by a single pipe manufacturer that has supplied similar size and type of pipe, fittings and specials for at least 5 years.

B. Marking for Identification: The name or trademark of the Pipe Manufacturer and the date and place of manufacture, coating and lining shall be stenciled on all Materials. Should the coating or lining be applied at another facility, the name or trademark of the applicator shall also be stenciled on the pipe. Pipe shall have the design working pressure and thickness or an accepted letter designation stenciled thereon. A serial number or other identification shall be conspicuously painted on each section of pipe, fitting and special. This serial number shall be used to track the pipe through the manufacturing process and shall appear on all appropriate test reports. Pipe that has been designed for abnormal load conditions shall have special markings which can be readily identified together with any special station requirements. Beveled pipe shall be marked to show the long, short and intermediate quadrant points.

C. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise required by the Contract Documents.

1. AWWA/ANSI C110/A21.10 American National Standard for Ductile-Iron and Gray-Iron Fittings.
2. AWWA/ANSI C111/A21.11 - American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
3. AWWA C115/A21.15-American National Standard for Flanged Ductile-Iron Pipe with Threaded Flanges.
4. ANSI Standard B16.1 Cast Iron Pipe Flanges and Flanged Fittings.
5. AWWA C600 Installation of Ductile-Iron Water Mains and Appurtenances.
6. AWWA/ANSI C104/A21.4 American National Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

7. AWWA/ANSI C151/A21.51 American National Standard for Ductile-Iron Pipe Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids.
8. ASTM A325 Specification for High Strength Bolts for Structural Steel Joints.
9. AWWA/ANSI C153/A21.53 Ductile-Iron Compact Fittings for Water Service.
10. AWWA C500/C509 Gate Valves for Water and Sewerage Systems.
11. AWWA C504 Rubber Seated Butterfly Valves.
12. AWWA C502 Dry-Barrel Fire Hydrants.
13. AWWA C206 Field Welding of Steel Pipe.
14. Commonwealth of Virginia/State Board of Health, Waterworks Regulations.

D. Quality Assurance Inspection and Testing:

1. Pipe shall be manufactured at plants in the United States of America which shall have permanent quality control departments and laboratory facilities capable of performing the inspections and testing required by the Contract Documents. All sampling, testing, inspection procedures and process of manufacture shall be subject to inspection by the Engineer, or Owner at any time.
2. Pipe Manufacturer shall make available an enclosed, heated, ventilated and air conditioned space with a full size desk, private line telephone, and 2 two drawer file cabinets for use by the Owner's Representative for the duration of the pipe manufacturing process.
3. Pipe Manufacturer shall perform all tests and inspections required by AWWA C151 (as modified herein) and these Specifications.

1.03 SUBMITTALS

A. The Contractor shall submit detailed catalog cut sheets, shop drawings, specifications, design calculations, shop test reports and certifications, and other data requested by the Engineer, showing complete details of the fabrication, construction, and certification, and procedures for handling and installation of pipe, fittings, specials, and connections, together with complete data covering all materials proposed for use. Submittals shall be in accordance with Section 105.IV of the General Provisions and shall include the following information in addition to the requirements of Section 105.IV of the General Provisions:

1. Shop drawings, catalog cut sheets and related data for pipe, fittings, valves, adapters, mechanical couplings, manholes, etc.
2. Graphical and tabular Lay Schedule.
3. Letter of Certification from Contractor: Contractor shall submit a letter certifying that valves, pipe, fittings and related items to be supplied by the Contractor conform to the requirements of the Contract Documents.
4. Certificates: Submit certificates of compliance to the Engineer before delivery of materials to the project site which shall include:
 - a. Manufacturer affidavit of compliance for pipe material used.
 - b. Manufacturer certificate for pipe thickness.
 - c. Manufacturer certificate of compliance for pipe lining and application procedure.

- d. Manufacturer mill test, reports for chemistry, physical, and hydrostatic test.
- 5. Other items required by the Supplemental Technical Specifications described herein.
- 6. Proposed Methods and Procedures:
 - a. Equipment, materials, and procedures for handling pipe, fittings and specials at the site.
 - b. Pipe closure methods and procedures.
 - c. Wrapping for buried flanges.
- 7. Test specimens: Furnished from pipe shell and gaskets when requested by the Engineer.
- 8. Acceptance of any submittal by the Engineer shall not relieve the Contractor of his responsibility to meet the requirements of the Contract Documents.
- 9. Connection Procedures:
 - a. The Contractor shall submit for approval by the Owner and the Engineer a detailed schedule of operations for each connection at least fourteen (14) days prior to beginning the Work of the overall project. After receiving approval for each connection submittal, the Contractor shall provide the Owner and the Engineer with a minimum of 48 hours notice before beginning work of any connection.
- 10. Installation Experience:
 - a. See Section 110.III for qualification requirements.
- B. Submittals shall indicate the ASTM designation for the material from which each class of pipe is fabricated.
- C. In addition to the markings, as specified under the governing (reference) standards, the Contractor's drawings shall include a complete laying schedule with piece description to show where each numbered pipe, fitting, or special is to be installed. The numbers indicated on the Contractor's approved design drawings shall correspond with those painted on the pipe.
- D. If the flange gasket materials to be provided are other than those specified herein, the Contractor shall obtain and submit a written statement from the gasket material manufacturer certifying that the gasket materials are compatible with the flanged joints specified herein and are suitable for the specified field test pressure.

1.04 REGULATORY REQUIREMENTS

- A. Commonwealth of Virginia/State Board of Health: Water main installation shall be in accordance with the Waterworks Regulations of the State Board of Health.
- B. Other requirements as specified in the HRPDC Regional Standards.

1.05 DELIVERY, STORAGE AND HANDLING OF MATERIALS

- A. Ductile Iron Pipe: Loading, unloading, handling, inspection and storage of ductile iron and gray iron pipe, fittings, accessories, and appurtenances shall be performed in accordance with AWWA C600 and approved submittals.
 - 1. Store pipe, fittings, valves, and appurtenant materials in a manner which will protect them from becoming dirty or damaged prior to installation.
 - a. Pipe, fittings, valves, and appurtenant materials which are visibly dirty shall be cleaned to the Engineer's satisfaction or replaced at the Contractor's expense prior to installation.
- B. Shipments of materials to Contractor or Subcontractor shall be delivered to the site only during regular working hours when the Owner's Representative is present on site. Shipments shall be addressed and consigned to the proper party giving name of Project, location and city. Shipments shall not be delivered to the Owner's storage yard except where otherwise directed. The Owner reserves the right to reject any materials delivered when the Owner's Representative is not present on site.
- C. The Contractor shall be responsible for coordinating delivery of pre-purchased materials to (and unloading at) the job site with the Materials Supplier(s) and City of Norfolk Representative, at no additional cost to the City of Norfolk.
- D. If it is necessary to move stored materials and equipment during construction, Contractor shall move or cause materials and equipment to be moved without any additional compensation.
- E. Arrange deliveries of products in accordance with construction schedules to facilitate inspection prior to installation.
- F. Coordinate deliveries to avoid conflict with Work and conditions at site.
- G. Do not have products delivered to Project site until related Shop Drawings have been approved by the Engineer.
- H. Use web slings or forklifts to handle the pipe. Metal chains, cable tongs or other equipment likely to cause damage to the coating shall not be used. Hooks shall not be used on the ends of the pipe.
- I. Where forklifts are used, their bearing surfaces must be padded with suitable material.
- J. Web slings shall be of a type and width that will not damage the coating. Slings shall not pass through the pipe.
- K. If cables or chains are used during transportation, they must be properly padded with approved suitable material to protect the coating from damage. Use padded separator strips between pipe and cable or chains.
- L. Pipe, fittings, and specials shall be unloaded opposite to or as close to the place where they are to be laid as is practical to avoid unnecessary handling.
- M. Materials cracked, gouged, chipped, dented or otherwise damaged will not be accepted. Minor defects in the pipe or coatings may be repaired at the site by a method approved by the

manufacturer of the materials and by the Engineer. Damaged pipe, fittings, specials and accessories shall be repaired or replaced at Contractor's expense.

- N. The Owner reserves the right to inspect all materials before unloading at the site. Any materials rejected shall not be unloaded and shall be returned to the manufacturer at no additional cost to the Owner.

PART 2 PRODUCTS

2.01 INCIDENTALS

- A. Concrete, temporary plugs/caps, welding materials, bonding conductors, hardware and all other items as shown on the Drawings, or necessary to complete the Work, accepted and suitable for the service.

2.02 MANUFACTURERS

- A. Ductile Iron Pipe and Fittings:

1. American Ductile Iron Pipe Company
2. U.S. Pipe and Foundry Company
3. Griffin Pipe Product Company

- B. Gaskets for Flanged Pipe:

1. Crane Packing Company
2. Garlock Packing Company
3. U.S. Rubber Company
4. Approved Equal

- C. Restrained Joints:

1. U.S. Pipe and Foundry Company - TR Flex
2. American Cast Iron Pipe Company - Flex-Ring
3. Griffin Pipe Product Company - Snap Lok and Bolt Lok
4. Atlantic States Cast Iron Pipe Company – Super Lok

- D. Push-On Joints:

1. American Cast Iron Pipe
2. Griffin Pipe Products Company
3. U.S. Pipe and Foundry Company
4. Atlantic States Cast Iron Pipe Company

- E. Mechanical Joints (Fittings):

1. American Cast Iron Pipe Company
2. Griffin Pipe Products Company
3. U.S. Pipe and Foundry Company
4. Atlantic States Cast Iron Pipe Company

F. Mechanical Joint Glands:

1. Tyler Pipe
2. Griffin Pipe Products Company (includes Columbus or Tyler glands)
3. U.S. Pipe and Foundry Company
4. Approved Equal

G. Gasket Lubricants:

1. Davis and Young Soap Co., Dayton, OH
2. William H. Harvey Co.
3. JTM Products, Inc.
4. Approved Equal

H. Restrained Joint Identification Tape:

1. Northtown Company, Huntington Beach, CA
2. Approved Equal

J. Mechanical Joint Restraining Glands:

1. Megalug Series 1100
2. Sigma Super Lug
3. Ford (sized up through 12 inches) – Uniflange

K. DIP/Cage Pipe Adapters

1. Hanson
2. Approved Equal

L. Polyethylene Encasement

1. Van Leer/Repcor, Inc.
2. AA Thread Seal Tape, Inc.

M. Flange Insulating Kit

1. PSI Industries, Inc.
2. Approved Equal

2.03 PIPE AND FITTINGS

A. Ductile Iron Pipe:

1. Pipe Materials: Ductile iron pipe shall meet the requirements of ANSI/AWWA Standards C151/A21.51. For pipe buried in the ground, the minimum thickness shall be Class 52, unless shown differently on the Drawings. Ductile iron pipe installed at a depth greater than 14 feet, locations where welded outlets are required, and where indicated on the Drawings, shall be thickness Class 53.
 - a. Gauged Pipe: Gauged pipe shall be circular pipe which has been checked by the Pipe Manufacturer to meet the outside diameter tolerance for joints throughout its

- length. Pipe meeting these requirements shall be called "gauged full-length pipe" and will be marked with a 4-inch wide green band painted on the pipe barrel.
- b. If grinding or milling is necessary to meet the requirements for gauged pipe, only pipe having 2 pipe thickness classes greater than those called for in the purchase order shall be machined. In no case will the machined thickness of the pipe be less than the pipe thickness class shown on the Drawings or specified.
2. Pipe joints shall be in accordance with the following:
- a. Push-on rubber gasket joints shall be of the bell and spigot type meeting the requirements of ANSI/AWWA Standard C111/A21.11 in all respects except details of the joint. The joint shall be of a type that employs a single elongated grooved gasket to effect the joint seal. The joint shall be "Fastite," "Super Bell Tite" or "Tyton Joint." Restrained joint pipe shall meet requirements of approved manufacturers referenced herein.
 - b. Flanged joints shall meet the applicable requirements of AWWA Standard C110 and C115 and ANSI Standard B16.1 and shall be faced and drilled to ANSI Class 125 (Ductile) standard template. Ductile iron pipe with threaded flanges shall have a minimum pipe wall thickness of 0.31 inch below the threads of machined section. Flange bolts shall straddle the centerline of the pipe or fitting. Bolts and nuts shall be low-carbon steel in accordance with ASTM A307, Grade B. Bolt-studs and nuts shall be furnished at insulated flanges in accordance with ASTM A193, Grade B7.
 - 1) For flanged pipe, flanges with long hubs shall be silver soldered or screwed on the end of the pipe in the shop and the face of the flange and end of the pipe refaced together. There shall be no leakage through the pipe threads and the flanges that shall be designed to prevent corrosion of the threads from outside.
 - 2) Where tap or stud bolts are required, flanges shall be tapped. Unless otherwise shown on the Drawings or specified, flanges shall meet the applicable requirements of ANSI Standard A21.10 and B16.1. They shall be accurately faced at right angles to the pipe with bolt holes drilled smooth and true, and shall be coated with rust veto immediately after facing and drilling.
 - 3) Gaskets for flanged joints shall be rubber with cloth inserts. Gaskets shall be full-faced, unless directed otherwise by the Engineer.
 - c. Joints with locking features shall have the ability to transmit axial load across the joint without separation or leakage. The appurtenances necessary to achieve these results shall be corrosion resistant and the restraining bolts shall be low alloy steel.
 - d. Beveled joints shall allow greater joint deflections than those shown in the appropriate tables in AWWA C600. The interior surfaces of the bell may be cast or machined to accomplish this increase in deflection; however, in no case will the bell thickness be less than the pipe barrel thickness. Beveled pipe shall have the permissible deflection marked on the pipe barrel.

3. Fittings: All fittings shall conform to the applicable requirements AWWA C110 or C153 and the following:
 - a. Standard pattern fittings shall conform to one of the following:
 1. Class 250 cast iron fittings.
 2. Class 350 ductile iron fittings (24-inch diameter or smaller).
 - b. Mechanical joint fittings shall conform to one of the following:
 1. Compact mechanical joint fittings shall be ductile iron, Class 350, in accordance with the requirements of ANSI/AWWA Standard C153/A21.53.
 2. Mechanical joint assemblies, including gaskets, glands, bolts, and nuts shall be in accordance with the requirements of ANSI/AWWA Standard C111/A21.11 and shall be furnished with all fittings. Glands for all fittings larger than 12-inches shall be ductile iron. Bolts and nuts shall be low-alloy steel. Mechanical joint bolt holes shall straddle the centerlines of the fittings.
 3. Provide mechanical joint assemblies in unrestrained areas. Mechanical joint assemblies are not permitted in restrained areas.
 - c. Push-on rubber gasket joints shall be of the bell and spigot type and shall conform to the applicable requirements of ANSI/AWWA Standard A21.10 and shall be of the lightest class permitted for the class of pipe in which the fitting is used.
 - d. Flanged fittings shall meet the applicable requirements of ANSI Standard A21.10 and ANSI/ASME Standard B16.1, with flanges meeting the requirements of ANSI/AWWA Standard A21.10. All fittings shall be of the lightest class conforming to the pressure ratings of the water mains which they connect. Flanges, flange facing, drilling and protecting shall be as specified for centrifugally cast pipe. Bolt holes shall straddle the centerlines of the fittings. Bolts and nuts shall be low-carbon steel in accordance with ASTM A307, Grade B. Bolt-studs and nuts shall be furnished at insulated flanges in accordance with ASTM A193, Grade B7.
 - e. (Ductile Iron) welded-on outlets will not be permitted. Mechanical joints shall be as specified above. All surfaces to be welded shall be ground. The pipe cut shall be ground smooth and any damage to the cement lining shall be repaired. The outlets shall be protected inside and out as specified in these Specifications. Pressure test all outlets to 300 psi after welding. Evidence of cracking, lack of fusion, severe undercut, excessive porosity, or other serious defects shall be cause for rejection.
 - f. Wall castings and make-up pieces, such as bell and bell, bell and spigot, bell and flange, flange and flange, flange and spigot, and flange and flare shall meet the requirements of ANSI Standard A21.10 and shall be of the lightest class which is standard for the class of pipe in which they are used.
 - g. Furnish flange to plain end adapters where shown on the Drawings or where otherwise accepted. The plain end joint shall be a mechanically compressed rubber gasket with follower ring. The inside diameter of the adapter shall be greater than the outside diameter of the plain end of the pipe being joined to provide a means of disassembly after installation.
 - h. Where special fittings are required, they shall be of an accepted design and shall have the same diameters and thickness as standard fittings, unless otherwise required. Their laying lengths and other functional dimensions shall be determined by their positions in the water mains and by the particular piping materials to which they connect.
 - i. Provide Flanged Joints and Flange Insulation Kits:
 - 1) Where shown on the Drawings, and in accordance with this Section.

- j. Furnish and install cast iron solid sleeves at all points where pipes must pass through the walls or floors of structures. Unless otherwise shown on the Drawings or specified, furnish and install cast iron solid sleeves. Where water-tightness is essential, the space between the pipe and the sleeve shall be caulked with lead and oakum or approved polysulfide joint sealer.
- 4. All pipe and fittings shall be cement mortar lined in accordance with ANSI/AWWA Standard C104/A21.4 including the bituminous seal coat. The mortar thickness shall be 1/8-inch with a plus tolerance of 1/4-inch for fittings.
- 5. Joint Lubricant: Vegetable type soap of viscous solution consistency. The joint lubricant shall be approved by the National Sanitation Foundation (NSF) for use in potable water. Petroleum-based or other type of lubricants that can damage the gasket shall not be used.

2.05 PROOF OF DESIGN TESTS

- A. Perform hydrostatic tests of the O-ring gasket joints proposed for use on the Project. Test nonrestrained joints for leakage. Test restrained joints for leakage and tensile strength.
- B. Pipe Manufacturer may submit certified reports of previous joint tests, performed on joints proposed for use, which were witnessed by outside parties. Such reports will be accepted in lieu of performing new tests if, in Engineer's opinion, the joint is the same as the proposed joint, the test meets the requirements of this Section and the results indicate satisfactory performance of the joint.
- C. Leakage test criteria:
 - 1. Test duration: >1 hour.
 - 2. Internal pressure: That of normal operation, as determined by the Owner's Representative.
 - 3. Leakage: No Visual Leakage
- D. Tensile Strength Test:
 - 1. Test assembly shall be 2 pipes with closed end joined by a restrained joint.
 - 2. Increase pressure until failure recording all signs of distress and the pressure at which they occurred.

2.06 RESTRAINED JOINT WATER MAIN PIPING IDENTIFICATION TAPE

- A. Tape shall be marked "Caution, Restrained Joint Pipe Below".
- B. All restrained joint piping shall be identified in the field with identification tape to be installed during backfill operations and laid one foot above water main piping.
- C. Payment for restrained joint water main piping identification tape shall be considered incidental to the pipe installation pay item.

2.07 MECHANICAL JOINT RESTRAINING GLANDS

- A. Mechanical joint restraint shall be provided in the design of the follower gland and shall include a restraining mechanism which, when actuated, imparts multiple wedging action against the pipe, increasing its resistance as the pressure increases. Flexibility of the joint shall

be maintained after burial. Glands shall be manufactured of ductile iron conforming to ASTM A536. Restraining devices shall be manufactured of ductile iron, heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to AWWA C111 and AWWA C153. The mechanical joint restraint device shall have a working pressure of at least 250 psi (sizes greater than 16-inches) and 350 psi (sizes 3-inch through 16-inch).

- B. Other acceptable joint restraint systems for push-on joints for Ductile Iron Pipe include U.S. Pipe TR Flex™, American Cast Iron Pipe Company Flex-Ring, Griffin Pipe Products Company Snap-Lok and Bolt-Lok, or Clow Corporation Super-Lock. Prestressed concrete cylinder pipe joint restraint systems shall be Price Brothers Snap Ring or C-Clamp type joint. Set screw type joints are prohibited.

2.08 FLANGE X RCCP ADAPTER

- A. Pipe Material: Reinforced concrete cylinder pipe shall meet the requirements of AWWA C300. Ends of adapters shall be fabricated to the dimensions required to connect to the existing reinforced concrete cylinder pipe and the adjoining new ductile iron pipe. Welded-on flanges shall conform to the requirements of this section.

2.09 POLYETHYLENE ENCASEMENT

- A. Reference Standards: ANSI/AWWA C105/A21.5, Class B Materials: Seamless 4 mils thick high density cross-laminated polyethylene. Flat tube form, minimum width based on nominal pipe diameter in accordance with recommendations by Ductile Iron Pipe Research Association.

2.10 INSULATING DEVICE

- A. Insulated Flange
 - 1. Materials
 - a. Insulating Gasket: Type “E” Neoprene-faced Phenolic. Machined to match particular pipe material being used. Inside diameter to be 3/32-inch less than net inside diameter of pipe and any internal coating or lining.
 - b. Insulating Sleeves: G-10 Epoxy/ Glass
 - c. Insulating Washers: G-10 Epoxy/ Glass. Provide two washers for each bolt.
 - d. Steel Washers: 1/8- inch thick plated hot rolled steel. Provide two washers for each bolt.

2.11 EXTERNAL COATING FOR INSULATING FLANGES

- A. Field Applied Heat Shrink Sleeves - Buried Insulated flanges:
 - 1. Approved Manufacturers:
 - a. CANUSA - CPS
 - b. Raychem Corporation
 - c. Approved Equal
 - 2. Materials: Contractor shall provide compatible primer; mastic for profiling around joints, bolts and other irregular shapes; All materials shall be by the same manufacturer.

2.12 FLEXIBLE EXPANSION JOINTS

1. Flexible expansion joints shall be installed in the locations indicated on the drawings and shall be manufactured of ductile iron conforming to the material requirements of ASTM A536 and ANSI/AWWA C153/A21.53.
2. Each flexible expansion joint shall consist of an expansion joint designed and cast as an integral part of a ball and socket type flexible joint, having a minimum per ball deflection of: 12° and 4-inches minimum expansion. Additional expansion sleeves shall be available and easily added or removed at the factory or in the field. Both standardized mechanical joint and flange end connections shall be available.
3. All internal surfaces (wetted parts) shall be lined with a minimum of 15 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C213. Sealing gaskets shall be constructed of EPDM. The coating and gaskets shall meet ANSI/NSF-61
4. Exterior surfaces shall be coated with a minimum of 6 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16.
5. Appropriately sized polyethylene sleeves, meeting ANSI/AWWA C105/A21.5, shall be included for direct buried applications.
6. Approved Manufacturers:
 - a. EBAA Iron, Inc. - FLEX-TEND Flexible Expansion Joint
 - b. Approved Equal

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing field conditions.
- B. Perform test pits at all utility crossings and interconnection locations, and as required on the Drawings.
- C. Inspect water main materials for cleanliness and absence of damage.
- D. Verify that excavation base is dry and ready to receive the Work and that excavations, foundations, dimensions and elevations are as indicated on laying schedules or accepted by Engineer.
- E. Verify that rated working pressure of the item to be installed is satisfactory for the service shown on the Drawings.

3.02 GENERAL

- A. Installation of each pipe joint and appurtenances shall be made in the presence the Owner's Representative. The Contractor shall coordinate his construction activities daily with the Owner's Representative and shall notify the Owner's Representative prior to each installation.
- B. Install materials as shown, specified, or recommended by the manufacturer and in conformance with reference standards and accepted Shop Drawings.
- C. Cover over the pipe shall be as shown on the Drawings, specified or otherwise accepted by the Engineer.
- D. Earthwork shall be as shown on the Drawings and specified in the applicable Sections of these Specifications.
- E. Take field measurements as necessary to ensure proper fitting of Work.
- F. Changes in alignment and grade shall be made by deflecting joints or with beveled or mitered pipe except where bends, wyes or similar fittings are shown.
- G. All materials shall be carefully examined for cracks, dents, damage or other defects before installation. Defective materials shall be rejected, removed and replaced. Any material found to be broken or defective after it has been installed shall be rejected, removed and replaced as specified in this Section.

3.03 PREPARATION

- A. Ductile Iron Pipe and Fittings:
 - 1. Push-on Joints
 - a. Thoroughly clean the groove and bell socket and insert the gasket, making sure that it faces the proper direction and is correctly seated.
 - b. After cleaning any dirt or foreign material from the plain end, apply lubricant in accordance with the pipe manufacturer's recommendations.
 - c. When pipe is cut in the field, bevel the plain end with a heavy file or an air-driven grinder to remove all sharp edges.
 - 2. Mechanical Joints: The socket and plain end shall be wiped clean of all sand and dirt and any excess coating in the bell shall be removed. The plain end, bell socket and gasket shall be washed with a soap solution.
 - 3. Flanged Joints: Rust-prevention grease shall be removed from the flanges using a solvent-soaked rag. The flanges and gasket shall then be wiped clean of all dirt and grit.
 - 4. All joints shall be made in the presence of the Owner's Representative.
 - 5. Keep a sufficient quantity of joint lubricant, gaskets, welding rod, joint lining and coating material on hand at all times.

3.04 DUCTILE IRON PIPE INSTALLATION

- A. Excavating, Trenching and Backfilling: shall be in accordance with Section 330 of the HRPDC Regional Standards.
 - 1. All Work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings. Contractor shall assume the full responsibility for establishing and maintaining alignment and grade.

2. The Contractor shall lay all pipe in trenches in accordance with the pipe manufacturer's approved laying schedule, when applicable, and the requirements of Section 330 of the HRPDC Regional Standards and this Section.

B. Pipe Laying:

1. Proper and suitable tools and appliances for the safe and convenient cutting, handling and laying of the pipe and fittings shall be used. The pipe and fittings shall be thoroughly cleaned by power washing before they are laid and shall be kept clean until they are accepted in the completed Work. Special care shall be exercised to avoid leaving bits of wood, dirt and other foreign particles in the pipe. If any such particles are discovered before final acceptance of the Work, they shall be removed and the pipe, valves and fittings replaced at the Contractor's expense. All mains shall be kept absolutely clean during construction. In matters not covered by these Specifications, laying of ductile iron pipe shall meet the requirements of AWWA Standard C600. Exposed ends of uncompleted lines shall be capped or otherwise temporarily sealed with approved watertight bulkheads at all times when pipe laying is not actually in progress.
2. Pipe laid in excavations shall be laid on good foundation, trimmed to shape and, secured against settlement. At joints, enough depth and width shall be provided to permit the making of the joints and the inspection of the bottom half of the joint. All elbows and tees shall be properly backed up and anchored so that there will be no movement of the pipe in the joints due to internal or external pressure. Pipes shall have solid bearing throughout their entire length.
3. The Contractor shall lay all pipe in strict accordance with the manufacturer's recommended procedures. When it is necessary to deflect pipe from a straight line in either the horizontal or vertical direction, or as otherwise directed by the Drawings or the laying schedule for curves, pipe deflections shall have a maximum joint deflection eighty per cent of the value shown in the joint deflection tables in AWWA C600. Under normal laying conditions, the depth of cover shall be 4 feet.
4. Where pipe is laid in rock trenches, a minimum space of 9 inches the rock shall be removed below the outside bottom of the pipe and shall be filled with select material to the limits of, and in accordance with Section 330 of the HRPDC Regional Standards before the pipe is laid.
5. When special beddings are shown on the Drawings or are ordered by the Engineer, they shall conform to the requirements of Section 330 of the HRPDC Regional Standards.
6. Temporary bulkheads shall be installed at the ends of sections where adjoining water mains have not been completed. All such bulkheads shall be removed when the need for them has passed or when ordered by the Engineer.

C. Joining Pipe and Fittings:

1. When joining pipes and fittings, the Work shall be done in strict accordance with the requirements of AWWA C600, the manufacturer's printed instructions, approved submittals and these Specifications.
2. Push-on joints shall be assembled with general procedure to be as follows:
 - a. Prepare pipe and joint as described in this specification Section.
 - b. Push the plain end into the bell of the pipe. Keep the joint straight while pushing. Make deflection after the joint is assembled.
3. Mechanical joints shall be assembled with general procedure to be as follows:
 - a. Prepare the socket and plain end as described in this specification section.
 - b. Place the gland on the plain end with the lip extension toward the plain end of the pipe, followed by the gasket with the narrow edge of the gasket toward the end of the pipe.

- c. The pipe shall be pushed into the bell socket and the gasket pressed firmly and evenly around the entire socket. The gland is then pushed up to the bell and centered on the pipe. Glands may require a wedge under the top side to assist in centering the gland lip against the gasket.
- d. The bolts shall then be inserted and tightened with the fingers until all are even. A ratchet wrench shall be used to complete the tightening of the bolts, care shall be exercised to tighten the opposite nuts to keep the gland square with the socket and the bolt stress evenly distributed. The following torque shall be applied:

<u>BOLT SIZE</u>	<u>TORQUE</u>
5/8-inch	45-60 Ft. lb.
3/4-inch	75-90 Ft. lb.
1-inch	100-120 Ft. lb.
1 1/4-inch	120-150 Ft. lb.

- 4. Flanged joints: shall be assembled with general procedure to be as follows:
 - a. Prepare flanges in accordance with the requirements of this specification Section.
 - b. The flanges shall be accurately aligned, using a spirit level, and pipe properly supported before the gasket and bolts are inserted. The rubber gasket shall be carefully placed to ensure full flow and proper sealing of the joint.
 - c. Bolt threads shall be given a light coat of thread lubricant and then inserted and the nuts turned up by hand. Bolts shall then be pulled up with a wrench employing the crossover method. Applied torques shall be in strict accordance with the manufacturer's requirements.
- 5. Restrained joints shall be installed, to the extent shown on the Drawings, and in accordance with these Specifications. Install identification tape during backfill operations one foot above water main piping.

- D. Pipe Cradles Encasements, and Other Support: Where concrete cradles or encasements are required, they shall be constructed in accordance with Section 03300 of these specifications, and the Drawings.
- E. Thrust Restraints: Thrust Restraints including restraining glands, concrete anchors and thrust collars, strapping or other approved restraining devices shall be in accordance with these specifications, and details on the Drawings.
- F. Temporary Bulkheads: At the ends of sections where adjoining pipelines have not been completed and are not ready to be connected, install temporary, externally braced test plugs approved by the Engineer. All such externally braced test plugs shall be removed when the need for them has passed or when ordered by the Engineer.
- G. Pipe Installed Within Structures and Concrete Encasements: Where temporary support are used, they shall be sufficiently rigid to prevent shifting of the pipe. No reinforcing in structure or concrete encasements shall touch the pipe.
- H. Sanitary Sewer Crossings:
 - 1. Maintain required separation between water and sewer facilities in accordance with Virginia State Board of Health "Water Works Regulations".

2. Provide concrete pier supports for existing Sanitary sewer pipe crossing over the water main in accordance with Drawings.

I. Utility Crossings:

1. Separation of 6-inch or less requires expansion material and shall be Rodofam No. 327 manufactured by W.R. Grace and Co., Vinylfoam No. 327 as manufactured by W.R. Grace and Co., or Vinylfoam No. 327 as manufactured by Sonneborn-Cotech.

K. All work performed by the Contractor shall conform to applicable sections of the Virginia State Board of Health "Waterworks Regulations" and these Special Provisions during the installation, testing and disinfection of waterworks facilities.

3.05 CONNECTIONS TO THE WATER SYSTEM

A. The Contractor shall connect the pipelines to existing water mains, as shown on the Drawings.

B. The Contractor shall meet with the Owner's Representative and review his proposed scheduling and construction procedures for the connection(s). No additional payment will be made to the Contractor for work which must be performed at night. Approval of the Contractor's connection(s) schedule and construction procedures by the Owner does not relieve the Contractor from his total responsibility to see that the connection(s) is successfully completed within the designated time frame.

C. The Owner will close all valves in making shutdown and open all valves in restoring pressure to the existing main and initiating pressure in the new installation. Connections to water mains shall be made by the Contractor only after complete preparation for such Work has been made.

D. At each location where a new water main is to be connected to the existing water main, the Contractor shall not order material for the connection until he has dug a test pit and verified the exact location, size, outside diameter, roundness, elevation, material, joint location, type and direction of the existing water main. The Contractor shall dig test pits only in the presence of an authorized representative of the Owner. If the test pit shows there is a conflict with an existing utility or a water main connection has to be modified, the Contractor shall submit test pit data information to the Engineer. The Engineer will review and modify the drawings as required.

E. Prior to the commencement of any water main interconnection work, the Contractor shall have all necessary materials, tools and equipment at the work site. Pipe, fittings and valves shall be pre-assembled as much as possible to reduce the time of water service interruption. Also the geometry of the connection shall be verified by the Contractor prior to starting the connection. Where existing mains are provided with fittings for the purpose of connecting to the new main, the Contractor shall remove the plugs or bulkheads, clean the ends, prepare them for connection to the new pipeline, and make the new joint.

F. The Contractor shall work continuously and expeditiously until the connections are successfully installed and water service is restored. Where the new water main is to be connected at more than one point to the existing water system, connections may proceed simultaneously. All connection work must be successfully completed within six hours, unless noted differently in writing by the Engineer or the City of Norfolk Department of Utilities. The Contractor shall commit the necessary personnel and equipment required to perform the

simultaneous connections within the above time constraints. Proposed water mains must be in service before existing water mains are abandoned.

- G. The water released by cutting or opening existing mains shall be removed and the excavation kept dry until all necessary Work within the excavation has been completed.

3.06 LEAKAGE TESTS

- A. Contractor shall perform leakage tests in accordance with Section 801 of the HRPDC Standards, the project's Technical Specifications and the Drawing's General Notes. Contractor shall make necessary repairs and repeat tests until required results are obtained.

END OF SECTION 02510

SECTION 02511

WELDED STEEL PIPE

PART 1 - GENERAL

1.01 SUMMARY

A. SCOPE

1. Contractor shall furnish all services, labor, materials, equipment and incidentals required to furnish, install and test Welded Steel Pipe (WSP), fittings, specials and accessories (referred to as Goods) as required for Horizontal Directional Drilled Installation.
2. The WSP pipeline shall employ the following coating and lining alternative as stated in the Agreement and specified in Section 09930-Welded Steel Pipe Coatings.
3. It is the purpose of the Drawings and of these Specifications to provide a complete and workable piping system. All miscellaneous fittings, adapters, specials and appurtenances necessary to complete the Work shall also be provided as a part of this Contract.

B. Unit Prices: Refer to Section 01200 – Measurement and Payment Procedures

C. Related Sections

1. Section 01600 - Material and Equipment
2. Section 01720 - Field Engineering
3. Section 02514 - Leakage Tests
4. Section 02520 - Horizontal Directional Drilling
5. Section 09930 - Welded Steel Pipe Coatings
6. Section 13110 - Cathodic Protection

1.02 QUALITY ASSURANCE

- A. Pipe Manufacturer Qualification: The piping, coating, lining and fabrication of specials specified herein shall be manufactured by a single manufacturer that has supplied similar size and type of pipe, fittings and specials for at least 5 years. The pipe manufacturer must have a certified quality assurance program. This certified program shall be ISO 9001:2000 or other equivalent nationally recognized program as approved by the Engineer.
- B. Design Responsibility: The design and layout of materials to meet the service conditions and the criteria specified in this Section are the responsibility of the Contractor. This work shall be performed by or under the supervision of a Professional Engineer.
- C. Plant Inspection: Materials furnished in accordance with this Specification may be inspected by the Engineer in accordance with Section 5.1 of AWWA 0200. The Contractor shall give the Engineer fifteen (15) working days advance notice of the start of any pipe fabrication or lining and coating application work.
- D. Marking for Identification: The name or trademark of the manufacturer and the date and place of manufacture, coating and lining shall be stenciled on all materials. Should the coating or lining be applied at another facility, the name or trademark of the applicator shall also be stenciled on the materials. Materials shall have the design working pressure and thickness or an accepted letter designation stenciled thereon. Materials that have been designed for abnormal load conditions shall have special markings which can be readily identified together

with any special station requirements. Beveled pipe shall be marked to show the long, short and intermediate quadrant points.

- E. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise required by the Contract Documents.
1. ANSI/AWS B2.1 – Specification for Welding Procedure and Performance Qualification.
 2. ANSI/AWS D1.1 – Structural Welding Code - Steel.
 3. ANSI B16.1 – Cast Iron Pipe Flanges and Flanged Fittings.
 4. ASTM A36 – Carbon Structural Steel.
 5. ASTM A139 – Electric-Fusion (ARC) Welded Steel Pipe.
 6. ASTM A572 – High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
 7. AWWA C200 – Steel Water Pipe 6 In. and Larger.
 8. AWWA C206 – Field Welding of Steel Water Pipe.
 9. AWWA C207 – Steel Pipe Flanges for Waterworks Service - Sizes 4 In. Through 144 In.
 10. AWWA C208 – Dimensions for Fabricated Steel Water Pipe Fittings.
 11. AWWA C210 – Liquid Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.
 12. AWWA C213 – Fusion Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines
 13. AWWA M11 – Steel Pipe - A Guide For Design and Installation, 3rd. Edition.
 14. ASME Section IX – International Boiler & Pressure Vessel Code: Welding and Brazing Qualifications
 15. NSF/ANSI 61 – Drinking Water System Components
 16. API Specification 5L
- F. Quality Assurance Inspection and Testing:
1. General: Manufacturer shall have a permanent quality control department and laboratory facilities capable of performing the inspections and testing required by the Contract Documents. All material testing, inspection procedures and process of manufacture shall be subject to inspection by the Owner and Engineer.
 2. Contractor shall perform all tests and inspections required by the referenced standards (as modified herein) and these Specifications including, but not limited to, the following. Correct all non-conforming conditions.
 - a. Steel Plate:
 - 1) Review mill certifications for conformance to requirements of the Contract Documents.
 - 2) Perform physical testing of each heat of steel for conformance to applicable ASTM standards.
 - b. Pipe:
 - 1) Inspect thickness, circumference, roundness, strength and size of seam welds, and squareness of pipe ends to verify compliance with AWWA C200.
 - 2) Inspect physical dimensions and overall conditions of all joints for compliance with AWWA C200, approved submittals, and the Contract Documents.
 - 3) The finished pipe section shall be pressure tested and hydrostatically tested in accordance with Section 02514-Leakage Tests of the specifications.
 - c. Linings:
 - 1) Inspect unlined materials for overall condition of the bare inside barrel. The inside barrel shall be free of all corrosive products, oil, grease, dirt, chemical, and other deleterious material.
 - 2) Inspect lined materials for physical dimensions and overall condition of the lining, visible surface defects, thickness of lining, and adhesion to steel surface.

- 3) Review certifications by manufacturers of lining components for conformance to AWWA Standards and the Contract Documents. Linings shall be NSF 61 approved for use in potable water systems.
- d. Coatings:
 - 1) Inspect physical dimensions and overall condition of coatings. Inspect for visible surface defects, thickness, and adhesion of the coating to the surface and between layers.
- e. Final Inspection:
 - 1) Before shipment, each finished pipe, fitting, special, and accessory shall be inspected for markings, metal thickness, coating thickness, lining thickness (if shop applied), joint dimensions and roundness. Inspect for coating placement and defects. Inspect linings for thickness, pitting, scarfing, and adhesion. Test all coatings and linings for holidays.

1.03 SUBMITTALS

- A. Prepare and submit the following in accordance with Section 01330-Submittals.
- B. Shop Drawings and Product Data: As required to completely describe the materials being furnished including, but not limited to:
 1. Design calculations, specifications, and product data sheets as necessary to fully describe all materials, components, and finished products and to show conformance with the Contract Documents.
 2. Dimension drawings showing full details of all materials to be provided including coatings and linings.
 3. Materials, equipment and procedures for handling coated materials both in the plant and in the field.
- C. Marking Schedule: Marks to be used on the finished materials to identify pipes, fittings, specials, and accessories shown on shop drawings and laying schedules.
- D. Installation and Pipe Layout Plan:
 1. Tabulated schedules designating each pipe, fitting, special, and accessory item necessary to complete the Work in sequence of installation. Coordinate identification of each piece with shop drawings, product data, and marking schedule.
 2. Include the following information:
 - a. Quantities and laying lengths of each piece.
 - b. Centerline stations and offsets with respect to the Project baseline at each change in horizontal or vertical geometry.
 - c. Centerline grade with respect to horizontal between each change of grade.
 - d. Centerline elevation referenced to Project vertical datum at each change in horizontal geometry and grade.
 - e. Orientation of outlets and bevels.
 - f. Joint opening dimensions other than zero (0) for each joint, to nearest one-eighth (1/8") inch; top or bottom, left or right.
 - g. Areas requiring special embedment conditions.
- E. Affidavits of Compliance: Furnish affidavits as described in the AWWA Standards applicable to the work.

- F. Quality Assurance Reports:
 - 1. Mill certificates and physical property test reports for steel plate for pipe walls.
 - 2. Hydrostatic test reports for each pipe test.
 - 3. Mill certificates and physical test reports for coating components. Physical test reports for adhesion and reports showing thickness and holiday detection tests.
 - 4. Mill certificates and physical test reports for lining components. Physical test reports for thickness and holiday detection tests.
 - 5. Mill certificates for epoxy components.
 - 6. Final inspection report for finished pipe.
- G. Test specimens: Furnished from steel for pipe shell and butt strap bell ring, from components for lining, when requested by Engineer.
- H. Acceptance of any submittal by the Engineer or Owner shall not relieve the Contractor of his responsibility to meet the requirements of the Contract Documents.

1.04 DELIVERY, HANDLING AND STORAGE OF MATERIALS

- A. Comply with Section 01600-Materials and Equipment.
- B. Coated pipe shall be handled and stored in such a manner as to protect the pipe and the coating from damage.
- C. Either web slings or forklifts may be used to handle materials at the manufacturer's plant. Only web slings shall be used at the site of the Project. Metal chains, cable tongs or other equipment likely to cause damage to the coating shall not be used. Hooks shall not be used on the ends of the pipe.
- D. Where forklifts are used, their bearing surfaces must be padded with suitable material.
- E. Web slings shall be a type that will not damage the coating. When pipe is handled with slings, there should be a minimum of two slings. Slings should be 18-inches wide. Slings shall not pass through the pipe. Handle pipe from cutback ends when possible.
- F. If cables or chains are used during transportation, they must be properly padded with approved suitable material to protect the coating from damage. Use padded separator strips between pipes.
- G. Store coated pipe on padded 4-inch wide (minimum) skids or select loamy or sand dirt berms, suspended from cutback ends where possible. Where skid chucks are used in contact with coated pipe, they should be padded. Padded chucks should be placed such that coated pipe is nested on skid rather than the chuck. Coated pipe shall not be laid on pavement without benefit of padding at contact points.
- H. Pipe, fittings, and specials shall be unloaded opposite to or as close to the place where they are to be laid as is practical to avoid unnecessary handling.
- I. Materials cracked, gouged, chipped, dented or otherwise damaged will not be accepted. Damaged pipe, fittings, specials and accessories shall be removed from the site and replaced at Contractor's expense.

1.05 JOB CONDITIONS

- A. The Contractor shall be responsible for laying-out, designing and providing materials suitable for the service.
- B. This Section contains certain minimum acceptable criteria for layout and design of the materials. Contractor's layout and design shall be suitable for the service and shall meet or exceed the criteria of this Section.
- C. The materials shall be suitable for the design working pressures (maximum sustained internal pressure), and other pressures as specified under this Section.
- D. The installed materials shall be adequate to transmit thrust forces resulting from internal pressure and shall suitably resist and prevent all movement resulting from these forces.
- E. The materials shall be suitable for the equivalent external loads produced by earth cover, surcharges, live loads and internal vacuum.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All materials shall conform to the requirements of the applicable AWWA standard except as modified in the Contract Documents.
- B. This Specification refers to specific products which have demonstrated acceptable performance. Contractor may propose other equal products for approval in accordance with the General Conditions. Documentation and case histories of satisfactory use of substitute products shall accompany such requests for approval.
- C. Steel plate and strip shall conform to the requirements of the following specifications except that carbon content shall not exceed two-tenths (0.2%) percent. Minimum thickness shall be six hundred twenty-five thousandths inch (0.625").

<u>Specification</u>	<u>Minimum Yield Strength (ksi)</u>	<u>Minimum Ultimate Tensile Strength (ksi)</u>
ASTM A572, GR 42	42	60

- D. Pipe:
 - 1. Pipe shall be 36-inch outside diameter as referenced on the Drawings, longitudinal or spiral seam welded type, fabricated and hydrostatically tested in conformance with AWWA C200, and designed in conformance with the requirements of AWWA C200, AWWA M11, ASTM A139 and as required by the Contract Documents, including all transient and external load conditions. Minimum finished pipe wall thickness for 36-inch nominal diameter pipe shall be six hundred twenty-five thousandths inches (0.625"). Minimum individual pipe segments shall be thirty (30') feet or greater.
- E. Joints:
 - 1. Pipe ends shall be in accordance with AWWA C200 and AWWA M11 and shall be beveled ends for field butt welding. All pipe ends for joint makeup shall be free of

- notches, weld splatter, and burrs. They shall be of correct diameter and shape.
2. Mitered Bends: Fabricate mitered fittings for connecting the directionally drilled pipe to the land water main. Mi ter-angle shall be field determined. Fittings shall be same grade steel and thickness as main pipe. Coating and lining provisions shall be the same as for the pipe. Mitered joint sections shall be furnished with one beveled end for field butt welding to HDD pipe and one flange end, which may be used as closure pieces to ductile iron pipe.
 - a. Mitered steel elbows shall be fabricated in accordance with AWWA C208. Elbows may be fabricated from two, three or more pieces. The number of pieces for a given elbow deflection shall be as follows:
 - 1) 0 - 29 degrees: two pieces
 - 2) 30 - 44 degrees: three pieces
 - 3) 45 - 60 degrees: four pieces
 - 4) 60 - 90 degrees: five pieces
 3. Flanges:
 - a. Flanges shall comply with applicable requirements of AWWA C207 for Class E steel ring flange. The template for flanges shall be as specified under ANSI B16.1 for Class 125 flanges and shall be compatible with insulating flanges.
 - b. Fasteners shall be as specified in AWWA C207. Bolts for Class E flanges shall be carbon steel, ASTM A193 grade B7 and nuts shall be ASTM A194 grade 2H heavy hex. Insulating gaskets shall be used as specified in Section 13110-Cathodic Protection.

F. Fittings:

1. Fittings, specials, and appurtenances including, but not limited to, special joints, elbows, tees, closures, adapters, bulkheads, caps, miscellaneous fittings, specials, and accessories shall be furnished as required by the Contract Documents and as required to complete the Work. Fittings and specials shall be designed, fabricated, and tested in accordance with AWWA C200, AWWA C208, and as required by the Contract Documents. Reinforcement of tees, wyes, crosses, etc. shall be designed in accordance with AWWA M11.
2. Provide all necessary adapters, specials and connection pieces for connecting to pipe made by other manufacturers. The ends shall be fabricated or machined to the exact dimensions required to connect the adjoining piece.

G. Coatings

1. Exterior Coating Application shall conform to Section 09930-Welded Steel Pipe Coatings.
2. Interior Lining Application shall conform to Section 09930-Welded Steel Pipe Coatings.

PART 3 - EXECUTION

3.01 GENERAL

- A. Provisions of this part of the specifications are in addition to the provisions of Section 02510-Ductile Iron Water Mains and Appurtenances
- B. Remove all bracing prior to installation.
- C. Protection of Coatings:
 1. At all times during construction of the pipeline, the Contractor shall take every precaution to prevent damage to the protective coatings. No metal tools or heavy objects shall be

permitted to come into contact unnecessarily with the finished coatings. Workmen shall not be permitted to walk upon the coatings, except when absolutely necessary and approved by the Engineer, in which case, they shall wear shoes with rubber or composition soles and heels or other suitable footwear which will not damage the coatings.

2. Pipe shall be hoisted to position by means of a minimum of two 18-inch wide belt slings. Dragging or skidding pipe on grade will not be permitted. Pipe shall be placed on rollers prior to pulling operation to prevent coating damage.
3. Perform holiday detection tests on all coated surfaces immediately prior to installation. The test shall be conducted in accordance with NACE SP0490-01. Repair all defects using accepted methods.

3.02 JOINING

- A. Welders shall be qualified in accordance with AWWA C206. Welders shall maintain current qualifications under the provisions of AWS B2.1. or ASME Section IX. Prior to any welding, submit a certified welder qualification test record for each welder to the Engineer for acceptance.
- B. All welding procedures used to fabricate pipe shall be qualified under the provision of AWS B2.1 or ASME Section IX.
- C. All welds shall be butt welded using full penetration single-vee groove welds.
- D. All joints shall be made in the presence of the Owner's Representative or the Engineer, except as otherwise accepted.
- E. Keep a sufficient quantity of welding rod and joint lining and coating material on hand at all times.
- F. In addition to testing required by AWWA C206, all field welded joints shall be inspected, full circumference, by radiological methods in accordance with Section 10 of API 5L American Petroleum Institute Specification for line pipe.
- G. The acceptance limits of radiological examination shall be as specified in Section E.4.5 of API 5L.
- H. The Contractor shall submit to the Engineer the film originals and certified test reports prepared by a qualified testing company verifying that all field welds conform to the acceptance limits of API 5L prior to the installation of any steel pipe on this Contract.
- I. All welds rejected as a result of radiological examination shall be repaired in accordance with Section E.10 of API 5L and shall be reexamined radiologically.
- J. After welding, all joints shall receive the protective coatings as specified in Section 09930-Welded Steel Pipe Coatings. Such coatings shall be allowed to properly cure as recommended by the coating supplier before further handling.

3.03 HYDROSTATIC TESTS

- A. Except where modified and supplemented by these Specifications, hydrostatic tests shall conform to Section 02514 – Leakage Tests. Tests shall be over the entire steel pipe length.

Furnish all necessary equipment and material, make all taps, and furnish all closure pieces for the pipe as necessary to complete the pressure test. The Owner's Representative or the Engineer shall be present at the official test.

- B. The entire steel pipe section shall be tested to demonstrate the integrity of the directionally drilled installation.
- C. Pipe shall be tested at a gauge pressure of 150 psi at the highest point of the pipe. The welded pipeline shall have no measurable leakage when tested.

END OF SECTION

SECTION 02514

PRESSURE AND LEAKAGE TESTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section covers pre-installation and post-installation pressure and leakage testing for new raw water mains prior to connecting the mains to existing raw water mains. This section addresses pressure and leakage testing for:
 - 1. Welded steel pipe installed by horizontal directional drilling (HDD)
 - 2. Water Main pipe connecting the HDD section to the existing raw water main (tie-in section).
- B. Schedule:
 - 1. Provide the City of Norfolk a minimum of seven (7) days notice prior to each test.

1.02 QUALITY ASSURANCE

- A. Criteria for Testing Water Mains:
 - 1. Pre-installation: required air test- prior to installation of the HDD crossing, the Contractor shall perform a pressure test on the steel raw water main using compressed air at 10 psi.
 - 2. Post installation: required hydrostatic test: The in-place water main shall be hydrostatically tested at a gauge pressure equivalent to 150 psi at the highest part of the main in accordance with AWWA C200-05- Steel Water Pipe 6-in. (150 mm) and Larger..
 - 3.
- B. Reference Standards:
 - 1. American Water Works Association:
 - a. AWWA C200 – Steel Water Pipe 6-inches and larger.
 - b. AWWA C600- Standard for Ductile Iron Water Mains and Their Appurtenances.

1.03 JOB CONDITIONS

- A. General:
 - 1. Prior to installation of the HDD crossing and following completion of the weld-up of the pipe string, the Contractor shall perform a pressure test using compressed air. The minimum pressure for the air test shall be a 10 psi.
 - 2. A hydrostatic pressure test shall be performed following installation of the crossing, but shall not be made until at least seven (7) days after any concrete (bulkheads, thrust blocks) is placed.

1.04 SUBMITTALS

- A. Submit detailed description of filling and testing procedures including, but not limited to, the following:

1. Schedule of test sections and piezometric test elevations.
2. Type and location of bulkheads; provisions for thrust restraint.
3. Proposed sources of water and points of introduction into the pipeline.
4. Proposed equipment and methods for admitting test water and filling.
5. Proposed sequence of activities.
6. Pressure gauge and meter calibration reports

PART 2 - PRODUCTS

2.01 MEASURING DEVICES

- A. The Contractor will provide meters and pressure gauges for use in testing. All meters and pressure gauges shall be professionally calibrated specifically for this project. The contractor shall provide calibration documentation to the City of Norfolk for review prior to conducting testing.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Tie- In Sections: Inspect each section of pipe and each pipe fitting before installation in conformance with the inspection requirements of the appropriate standard.
- B. The HDD section will be inspected in accordance with AWWA C200-05- Steel Water Pipe 6-in. (150 mm) and Larger and in accordance with these specifications.
- C. Remove rejected pipe and/or fittings from project.

3.02 PNEUMATIC PRESSURE TEST OF HDD PIPE SECTION

- A. Prior to pull back, the entire length of steel HDD pipe shall be tested by a low pressure pneumatic test using not more than 10 psi air pressure. The entire HDD pipe shall be visually inspected, including all welds, using water and detergent for leakage detection.

3.03 HYDROSTATIC PRESSURE TESTING

- A. General: Conduct hydrostatic pressure and leakage tests specified herein so that each pipe line installed in the Project is tested in accordance with these Specifications.
 1. Provide test bulkheads, test pump, pipe connection to main and all necessary tools, materials and equipment required for the main testing.
 2. The hydrostatic testing equipment and testing installation shall be approved by the City of Norfolk.
 3. Conduct the hydrostatic pressure and leakage tests in the presence of the City of Norfolk.
 4. The steel pipe utilized for the horizontal directional drilling shall be tested following completion of welding according to the Pneumatic Pressure Test in Section 3.02 and also following installation according to the Hydrostatic Pressure

Test in this section. The ductile iron pipe used for the tie-in sections shall be tested hydrostatically according to this section.

5. The HDD steel pipe section shall be tested independently from the final tie-in sections.

B. Preparation:

1. Tie-in sections: The Contractor shall completely backfill the trench prior to carrying out the pressure test.
2. The section of water main being tested must be filled with water a minimum of 24 hours before the main is tested.
3. Extreme care must be exercised to insure that all air is expelled during the filling of the pipe with water.
4. Costs for water for pressure testing of each section shall be borne by the Contractor. Contractor shall coordinate with the appropriate City on limitations regarding obtaining City water for use. This will include RPZ and flow meter requirements. All costs associated with any retesting shall also be at the Contractor's sole expense.

C. Hydrostatic Pressure Test

1. After the pipeline has been filled with water for 24 hours, conduct a pressure test. The duration shall be at least two (2) hours. Test pressures for each section of water main to be tested as specified in Paragraph 1.02.A.1.
2. Apply the specified test pressure by means of a pump connected to the pipe in a manner satisfactory to the City of Norfolk.
3. HDD Section: After HDD pipe is pulled through the drill hole, the pipe shall be hydrostatically tested as specified herein. Allowable leakage is zero (0) and any detected leakage or pressure failure shall constitute a test failure.
4. Tie-in Sections: A leakage test will be performed:
 - a. Leakage Test:
 - 1) Leakage test following installation shall be conducted concurrently with the hydrostatic pressure test.
 - 2) Provide suitable means to measure the leakage during the test, and means to record the amount of water added to the pipeline during the test period of at least 2 hours.
 - b. Allowable Leakage: The leakage determined by the above test shall not exceed the allowable leakage for ductile iron piping given by the following formula:

$$L = \frac{S D (P)^{0.5}}{148,000}$$

Where:

L = allowable leakage, in gallons per hour

S = length of pipe tested, in feet

D = nominal diameter of the pipe, in inches

P = average test pressure during the leakage test, in pounds per square inch (gauge)

5. Tie-in Sections: Carefully examine all exposed pipes, joints, fittings, and valves during the test, and tighten all joints showing visible leakage. All defective pipe,

fittings and valves shall be removed and replaced from the water main by the Contractor at his expense.

6. Tie- in Sections: The Contractor shall open up the trench, at his own expense, to repair any leaks where the pressure gauge fails to hold the required specified pressure.

- D. Any pipe sections, joints or connections (Tie- in Sections) which were not hydrostatic tested shall have the joints visually inspected for leaks 30 minutes after the pipe has been restored to full operating pressure. Any observed leaks or drips shall be corrected by the Contractor.

- E. Any pipe sections, joints or connections (Tie- in Sections) that are not practical for hydrostatic testing shall have the joints visually inspected for leaks 30 minutes after the pipe has been restored to full test pressure. Any observed leaks or drips shall be corrected.

- F. Repair and Retest: If a water main or section of water main fails to meet the specified test requirements and has to be repaired it shall be retested to demonstrate that it meets the specified test requirements.

- G. Un-repairable leakage of the HDD pipeline shall be considered a failed installation of the crossing. Contractor shall be entitled to no monies due or receivable for a failed installation of the crossing. The Contractor will only receive payment for successfully installed HDD crossings.

- H. Include costs for above stated tests in the bid price for the Work. No separate payment will be made for pressure or leakage testing.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete Materials
 - 1. Cement
 - 2. Aggregates
 - a. Sand
 - b. Stone and Gravel
 - 3. Water
 - 4. Admixtures

1.02 REFERENCES

- A. ACI 212 Guide for Use of Admixtures in Concrete.
- B. ACI 304 Placing Concrete by Pumping Methods
- C. ACI 306 Recommended Practice for Cold Water Concreting.
- D. ACI 308 Recommended Practice for Curing Concrete
- E. ACI 318 Building Code Requirements for Reinforced Concrete
- F. ACI 347 Recommended Practice for Concrete Formwork
- G. ACI 614 Recommended Practice for Measuring, Mixing and Placing Concrete
- H. ASTM C33 Specification for Concrete Aggregates
- I. ASTM C39 Compressive Strength of Cylindrical Concrete Specimens
- J. ASTM C42 Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
- K. ASTM C94 Specification for Ready Mix Concrete
- L. ASTM C109 Compressive Strength of Hydraulic Cement Mortars
- M. ASTM C136 Sieve Analysis of Fine and Coarse Aggregates
- N. ASTM C138 Test for Unit Weight, Yield and Air Content of Concrete
- O. ASTM C143 Test for Slump of Portland Cement Concrete
- P. ASTM C150 Specification for Portland Cement
- Q. ASTM C171 Sheet Materials for Curing Concrete

- R. ASTM C172 Sampling Fresh Concrete
- S. ASTM C173 Test for Air Content of Freshly Mixed Concrete by Volumetric Method
- T. ASTM C191 Time of Setting of Hydraulic Cement by Vicat Needle
- U. ASTM C192 Making and Curing Concrete Specimens in the Laboratory
- V. ASTM C260 Air-entraining Admixtures for Concrete
- W. ASTM C309 Liquid Membrane-Forming Compounds for Curing Concrete
- X. ASTM C494 Chemical Admixtures for Concrete
- Y. ASTM C596 Measuring the Drying of Shrinkage of Mortar Containing Portland Cement
- Z. ASTM C827 Tests for Early Volume Change of Cementitious Mixtures
- AA. ASTM D412 Specification for Concrete Drain Tile
- BB. Federal Specification TT-S227E
- CC. Federal Specification TT-S230C
- DD. Corps of Engineers C572
- EE. VDOT Road and Bridge Specifications, Latest Edition.

1.03 DEFINITIONS

- A. Cast-in-place concrete shall be designed for a minimum compressive strength of 4,000 psi at 28 days.
- B. Architectural Concrete: Is defined as the ultimately exposed areas of exterior and interiors of buildings, chambers, galleries, vaults, foundations, parapets (including portions to be covered by roofing or flashing material), tanks and basins limited on the interior to a point that is 2 feet below the normal water level.
- C. Mass Concrete: Mass concrete is any cast-in-place concrete with dimensions large enough to require that measures be taken to cope with the generation of heat and attendant volume change to reduce cracking.

1.04 SUBMITTALS

- A. Shop Drawings: Submit Shop Drawings in accordance with Section 105.IV of the General Provisions for the following:
 1. Architectural formwork
 2. Steel forms

- B. Samples: Provide representative samples of the following items in accordance with the requirements of Section 105.IV of the General Provisions.
 - 1. Aggregate: Provide a 50-pound sample 15 days prior to the first day concrete is used.
 - 2. Fine Aggregate for Architectural Concrete: Submit a representative color sample for approval 15 days prior to the first day of use.
- C. Concrete Mix Design: Concrete mix designs shall be prepared and submitted to the Engineer for approval for each type required.

1.05 REGULATORY REQUIREMENTS

- A. American Concrete Institute: Perform Work covered by this Section in accordance with the requirements of the American Concrete Institute.
- B. Concrete shall conform to applicable sections of VDOT Road and Bridge Specifications.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Cement:
 - 1. Delivery: Cement delivered to the jobsite shall be in strong, well made bags marked with the brand, name of manufacturer and net weight.
 - 2. Storage: Store cement in weathertight building with a wood floor raised above the ground and protected from dampness.
 - a. Stack and store individual shipment in a manner which permits each shipment to be readily accounted for at all times.
 - b. Provide all facilities necessary to permit sampling and inspection of each shipment.
 - c. Do not use cement which has deteriorated.
 - d. Cement remaining in storage prior to shipment for a period exceeding 6-months after testing shall be re-tested and rejected if it fails to meet any requirements of these Specifications.
 - e. Do not use previously accepted cement which has been in storage more than 1 year from the time of original acceptance.
- B. Aggregate: Keep aggregates clean and free from all other materials during transportation and handling. Keep fine and coarse aggregates separated from each other until measured in batches and placed in the mixture.
 - 1. Stockpiling: Unless finish screening is provided at the batch plant, stockpile aggregates in a manner to prevent segregation and in accordance with ACI Standard 614.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Cement: Provide Type II Standard Portland Cement, which meets the requirements of ASTM C150:
 - 1. Domestic manufacturers: Provide cement which is produced domestically.
 - 2. Architectural Concrete: Provide cement which is uniform in color and type from one manufacturer for use in architectural concrete.
- B. Fine Aggregate: Fine aggregate shall be natural sharp sand meeting the requirements of ASTM C33 except as modified herein:

1. Limits for deleterious substances: The limits for deleterious substances shall be as set forth in Table 1 of ASTM C33 for concrete subject to abrasion.
2. Color: Fine aggregate for architectural concrete shall be of one type and color.
 - a. Fine aggregate subjected to the test for organic impurities and producing a color darker than standard will be rejected without exceptions.
3. Soundness: Fine aggregate shall meet the requirements of the soundness test set forth in paragraph 7.1 of ASTM C33.
4. Fine aggregate for mortar and grout: Fine aggregate for mortar and grout shall be well graded within the following limits by weight when tested in accordance with ASTM C1126.

<u>SIEVE</u>	<u>PERCENTAGE PASSING</u>
No. 4	100
No. 8	96 to 100
No. 16	40 to 65
No. 30	15 to 35
No. 50	5 to 15

- C. Coarse Aggregate: Coarse aggregate shall consist of gravel or crushed stone and shall meet the requirements of ASTM C33. The limits for deleterious substances and physical property requirements given in Table 3 of ASTM C33 shall apply for each class designation without exception. Coarse aggregate shall be graded according to Sizes 46 and 57 in Table 11 of the Standard.
 1. Coarse Aggregate Specification: Size No. 57 shall be used for all thin or closely reinforced concrete work, such as floors and roofs less than 7-inches thick, walls less than 9-inches thick, and all beams. For all other concrete work, Size No. 46 shall be used.
 2. Color: Coarse aggregate for concrete shall be of one type and color.
- D. Admixtures: The use of admixtures shall be limited to the following:
 1. Air-entraining: All concrete shall contain an air-entraining admixture conforming to ASTM C260 and sufficient to produce from 4 to 6.5 percent entrained air in the concrete.
 2. Water reducing: Water reducing admixtures, conforming to ASTM C494, Type A, shall be used when approved by the Engineer.
 3. Set retarding: Set retarding admixtures, conforming to ASTM C494, Type D, shall be used when approved by the Engineer.
 4. Fly ash: Fly ash, for use in flowable fill, shall conform to Section 241 of the VDOT Road and Bridge Specifications.
- E. Water: Water used in mixing concrete shall be clean and shall not contain deleterious amounts of acids, alkalies or organic materials. All water shall be furnished from sources approved by the Engineer.
- F. Expansion Joint Material: Joint filler shall be closed-cell PVC foam of the thickness shown, and shall be Rodofoam No. 327 as manufactured by W.R. Grace and Co., Vinylfoam No. 327 as manufactured by W.R. Grace and Co., and Vinylfoam No. 327 as manufactured by Sonneborn-Cotech, or approved equal.
- G. Waterstops: Provide waterstops made of extruded polyvinyl chloride.
 1. Requirements for plastic and waterstops: Provide plastic waterstops which meet the requirements of Corps of Engineer Specification ORD-C572, except as modified herein.
 - a. The Shore A durometer hardness shall be between 65 and 75.

- b. The minimum tensile strength shall be 1850 psi.
 - c. Specific gravity shall not exceed 1.38.
 - d. Waterstops shall have ribbed longitudinal strips.
2. Dimensions: Unless otherwise shown, provide waterstops which are flat, a minimum of 6-inches wide, not less than 1-1/4-inches thick at the narrowest point, and not less than 3/8-inches thick immediately adjacent to the center.
- H. Membrane Waterproofing: Provide membrane waterproofing which meets the requirements of ASTM C309 and is a semi-flexible material composed of an asphaltic core to which is bonded on independent weather proof coating. The coating is to be bonded during the manufacturing process.
- 1. Protective coating requirements: Protective coating shall form a continuous layer over the waterproofing core.
 - 2. Membrane vapor transmission rate: Membrane shall have a constant rate of water vapor transmission not greater than 0.0066 grains per square foot per hour measured in accordance with ASTM E96.
- I. Joint Sealant: Joint sealant materials may be either a single component urethane compound meeting the requirements of Fed. Spec. TT-S-230C, or a two-component urethane compound meeting the requirements of Fed. Spec. TT-S-227E, except as modified herein.
- 1. Urethane sealant: The urethane sealant shall be 100 percent polymer, non-extended, containing no solvent, lime, or coal tar. Color shall be as selected by the Owner or Engineer. Sealant properties shall conform to the following Table:

<u>PROPERTY</u>	<u>VALUE</u>	<u>TEST METHOD</u>
Maximum Final cure (days)	10	ASTM D412
Tensile strength (psi)	75-50	ASTM D412
Minimum elongation (1%)	400	ASTM D412
Modulus @ 100% elongation (psi)	35-50	Fed. Spec.
Shore A hardness	20-35	Shore Durometer
Solid content (1%)	98-100	
Peel content (1%)		Fed. Spec.

<u>PROPERTY</u>	<u>VALUE</u>	<u>TEST METHOD</u>
Minimum recovery (1%)	90	Fed. Spec.
Initial tack-free cure (hrs.)	24-48	Fed. Spec.

- 2. Joint sealant for unbonded joints: Where removable concrete slabs are not poured in place, horizontal and vertical joints shall be filled with self-leveling or non-sagging colma joint sealer, respectively, as manufactured by the Sika Chemical Corporation of Lyndhurst, NJ, or approved equal.
- J. Sheet Curing Materials:
- 1. Paper shall consist of only ply of an approved type of fiber reinforced waterproof building paper, consisting of cross fibers embedded in asphalt between two layers of waterproof building paper.
 - 2. Polyethylene film shall be white, opaque sheeting a minimum of 4 mils in thickness. The sheeting shall be manufactured from virgin resins and shall contain no scrap or additives.

2.02 MIXES

- A. Concrete: Concrete to be used in the respective places shown on the Drawings or as specified shall be divided according to compressive strength.
- B. Concrete classifications: Refer to these Specifications and the Drawings to determine which class of concrete to use in a given application.
 - 1. Concrete shall have a 28 day test strength of 4000 psi.
- C. Concrete mix design: Prepare mix designs for each type of concrete required in accordance with ACI 613.
 - 1. Concrete of any class which is to be placed by pumping methods shall require a separate mix design.
- D. Admixtures: Admixtures shall be used as directed in these Specifications and Drawings.
 - 1. When more than one admixture is to be used, each admixture shall be dispensed separately into the mix, and at separate times during the mixing in accordance with ACI 212.
- E. Cement content: Minimum cement content shall be as follows:

<u>CONCRETE CLASS</u>	<u>CEMENT CONTENT (# OF 94 LB SACKS)</u>
4000 psi	6.75

- F. Water-cement ratio: Concrete mixtures shall be proportioned to give adequate workability for the use intended without exceeding the following prescribed quantities of mixing water:

<u>CONCRETE CLASS</u>	<u>TOTAL WATER – U.S. GALLONS PER 94 LB. SACK OF CEMENT</u>
4000 psi	5

- 1. The quantity of mixing water shall be determined on the basis of either laboratory trial batches or field experience in accordance with ACI 318.
 - 2. The quantity of water used in each batch shall be the total quantity, including surface moisture contained in the aggregates.
- G. Ready mixed concrete: Ready mixed concrete shall meet the requirements of ASTM C94 except as modified in these Specifications.

2.03 GROUT

- A. Grout: Grout shall be a flowable, prepackaged, non-shrink and non-stain grout without dependence on gas expansion forces or enlargement of metal particles for its non-shrink characteristics.
- B. Packaging: The grout shall be packed in moisture-proof bags with general instructions for placement printed on the bag.

PART 3 EXECUTION

3.01 PREPARATION

- A. Measurement and Mixing: Measurement and mixing of concrete shall be subject to the review of the Owner in all respects and shall be performed in accordance with the recommendations of ACI 304, as modified herein.
1. Measuring requirements: Measure cement, fine and coarse aggregates separately by weight by equipment providing accuracy within 1 percent of the net load weighed. Water shall be measured by a suitable device, accurate to within 1 percent of the total amount required for the batch.
 2. Measuring equipment: The accuracy of the weighting equipment shall meet the requirements of the United States Bureau of Standards and standard testing weights and other necessary equipment shall be available at all times for testing the equipment.
 3. Mixing: Concrete shall be mixed in rotary, batch type mixer of adequate design to produce a thorough mix, homogenous in composition and uniform in color. Each batch of 1 cubic yard or less shall be mixed not less than 1-1/2 minutes after the last of the ingredients have been added to the mixer. The mixing time shall be increased 15 seconds for each additional cubic yard or fraction thereof.
- B. Ready-Mixed Concrete:
1. Rate of delivery: The rate of delivery of the mixed concrete shall be such that the interval between placing of fresh concrete in contact with concrete already placed from previous batches shall not exceed 45 minutes. The elapsed time between the introduction of mixing water to the cement and aggregates and depositing concrete in the Work shall not exceed 60 minutes, including mixing and agitating time.
 2. Delivery equipment: Delivery of concrete in non-agitating equipment shall not be permitted.
 3. Addition of water: No water shall be added to the concrete at the site unless accepted by the Owner or Engineer for a specific batch. Acceptance of such addition to one batch shall not be construed as acceptance of additions to subsequent deliveries.

3.02 INSTALLATION

- A. Placing Concrete:
1. General: Place concrete only in presence of the Owner in forms which have been accepted by the Owner. Where procedure is not specified, place concrete in accordance with ACI 304.
 2. Continuous Operation: Concreting operations shall be continuous until the section, panel, or scheduled placement is completed. Should the concreting operations be unavoidably interrupted, construction joints shall be formed at proper locations as specified.
 3. No Placement After Initial Set: No concrete shall be placed after its initial set has occurred, and no re-tempered concrete shall be used under any conditions.
 4. Minimum Handling: Concrete shall be conveyed and placed with minimum handling and by means of buckets, buggies, chutes, pumps, or other approved equipment that will prevent segregation of the ingredients. The slope and length of chutes shall be subject to the acceptance of the Owner. Outlets of chutes, hoppers, and conveyor belts shall be provided with suitable baffles to prevent segregation. Apparatus shall be kept clean and flushed with water before and after each run. Concrete shall be deposited in the forms as close as possible to its final position and, in no case, more than 5-feet in a horizontal direction therefrom. Re-handling of concrete will not be permitted.

5. Placement in Layers: Place concrete in layers shallow enough so that the previous layer is still soft when the next layer is added. The two layers can be vibrated together.
 - a. The maximum layer depth shall not exceed 18-inches.
 - b. The elapsed time between placing layers shall not exceed 45 minutes.
 6. Elimination of Voids: Take special care to place concrete against the forms, particularly in angles, and corners in order to prevent voids, pockets and rough areas and to assure continuous contact of the entire surface of the reinforcing steel and inserts with concrete.
 - a. Rod or spade concrete, if needed, to work coarse material away from forms.
 7. Protection: Protect freshly placed concrete against damage from the elements or other sources.
 8. Vibrating: Consolidate all concrete by means of mechanical internal vibrators applied directly into the concrete in a vertical position.
 - a. The intensity and duration of vibration shall be sufficient to cause concrete to flow, to compact thoroughly and to embed reinforcement, pipes, conduits, and similar Work completely. Vibrators shall not, however, be used to cause concrete to move more than a short distance horizontally. Vibrators shall be inserted and withdrawn at points 18- to 30-inches apart, and vibration shall be stopped immediately when a sheen of mortar first appears on the surface.
 - b. Vibrators shall operate at a speed of not less than 4500 cycles per minute. Each tool shall weigh approximately 15 pounds and shall be capable of producing a visible effect upon concrete mixture with a 1-inch slump for a distance of at least 18-inches from the vibrator. A sufficient number of vibrators shall be on hand to assure that the incoming concrete can be properly compacted within 15 minutes after placing. Reserve vibrators shall be on hand for the time when others are being serviced. No placement of any concrete shall be made with a single vibrator on hand.
- B. Special Requirements:
1. Hot Weather Requirements: Follow the requirements of ACI 305 and the following for placement of concrete during hot weather.
 - a. Concrete in excess of 90 degrees F. at the time of placement shall not be used.
 - b. A water reducing set retarding admixture may be used in accordance with the provisions of these Specifications when concrete temperature is consistently about 75 degrees F. and a noticeable decrease in slump or an increase in mixing water demands occur.
 2. Cold Weather Requirements: Follow the requirements of ACI 306 and the following for placement of concrete during cold weather.
 - a. Set accelerators shall not be permitted.
 - b. Protect concrete placed in the Fall from the time of the first frost until mean daily temperature at the site falls below 40 degrees F. from freezing for a minimum period of 24 hours after it is placed.
 - c. While mean daily temperatures are below 40 degrees F., the temperature of the concrete shall be not less than 50 degrees F. and shall be maintained at this temperature for at least 72 hours, or, if structural requirements are critical, until such time as is required to develop the necessary compressive strength. The internal temperature for concrete at the time of placing during this period shall not exceed 60 degrees F.
 - d. Protect concrete, placed in the Spring after mean daily temperature rises above 40 degrees F. from freezing in a similar manner to that described in the preceding sentences, until danger of freezing is past.

- C. Curing:
1. General: Follow recommendations of ACI 318 and the following for curing concrete.
 - a. Protect concrete surfaces, which will normally be exposed to the atmosphere, against drying too rapidly for a minimum period of 7 days.
 - 1) Refer to requirements of applicable subparagraphs on hot or cold weather curing.
 - b. Curing procedure shall begin immediately following placing the concrete.
 - 1) If a delay in application of curing procedure occurs, cover concrete with moistened burlap held in complete contact with the surface or kept moist by continuous sprinkling.
 - c. Use one of the following methods, subject to approval of the Owner or Engineer, for curing concrete.
 2. Water Curing: Use quilted covers, wetted and applied to the concrete surface as soon as forms have been removed or, in the case of slabs, as soon as concrete has set sufficiently to prevent marring of finish.
 - a. Quilted covers shall consist of an outer covering of burlap or cotton, and a needled, punched or sandwiched inner layer of cotton batting, in all weighing a minimum of 20 ounces per square yard.
 - b. Maintain covering materials in a thoroughly saturated condition sufficient to show the presence of free water between mat and concrete surface at all times throughout curing period.
 3. Sheet Curing: Sheet curing of concrete slabs is accomplished through use of sheet materials such as waterproof paper or polyethylene film, both meeting the requirements of ASTM C171, applied to the concrete surface as soon as it has set sufficiently to prevent marring.
 - a. Wet concrete surface thoroughly, then place sheet goods in direct contact and anchor in a manner which assures continuous contact during curing period.
 - b. Lap sheet materials a minimum of 3-inches, then tape, glue or cement seams.
 - c. Sheeting materials shall not discolor concrete surface.
 4. Membrane Curing: Begin membrane curing immediately after removal of forms, or in the case of uniformed surfaces, as soon as water sheen is no longer visible on the concrete surface.
 - a. Coat the entire exposed surface with a liquid membrane forming compound containing a temporary color indicator.
 - b. Apply membrane coating by means of an approved pressure spray distributor at the rate of 1 gallon of material per 200 square feet of concrete surface.
 - 1) Do not apply membrane curing to the faces of construction joints or other surfaces against which additional concrete will be placed. Keep those surfaces continuously wet by other means.
 - 2) Do not apply membrane coating to surfaces which are to be covered with a coating material applied directly to the concrete or with a covering material bonded to the concrete, such as other concrete, liquid floor hardener, waterproofing, damp-proofing, membrane roofing, floor painting and other coatings and finish materials, unless otherwise specified.
 5. Special Requirements:
 - a. During hot weather, protect concrete surfaces from drying by continuous moist curing for a period of at least 24 hours.
 - 1) Start curing procedure as soon as concrete surface has hardened sufficiently to withstand surface damage.
 - 2) If moist curing is not carried beyond 24 hours, cover surface, while damp, with a suitable heat-reflecting plastic covering or spray with a white pigmented curing compound.

- b. During cold weather, protect concrete against freezing in accordance with ACI 306 and the following:
 - 1) When protection against low temperatures is removed at the end of the required period, remove it in a manner such that the resulting temperature drop in any part of the concrete does not exceed 40 degrees F. during the first 24-hour period.
 - 2) Do not permit concrete in heated enclosures to dry out.
- D. Waterstops: Waterstops for corners and intersections shall be prefabricated so that only butt joints need to be made in the field.
 - 1. Corners and Intersections: Field fabrication of corners and intersections requires the Owner's approval. Miter and assemble corners and intersections with approved equipment as described for field joints.
 - 2. Field Joints: Make field joints by cutting the ends of the sections to be spliced so they will form a smooth, even butt joint.
 - a. Heat the cut ends with splicing tool until plastic melts. Press ends together until the plastic cools.
 - b. Splicing shall cause as little damage to the continuity of the ribbed strips as possible.

3.03 FIELD TESTS

- A. Slump Tests: Conduct slump tests in accordance with ASTM C143 and the following
 - 1. Allowable Slump: Provide a concrete mixture which has a slump of 5-inches or less.
 - 2. Tolerances: A tolerance of up to 1-inch greater than these amounts shall be allowed for individual batches provided the average to all batches or the 10 most recent batches, whichever is fewer, does not exceed the maximum allowable slump.
 - 3. Excessive Slump: Concrete with excessive slump shall be rejected and no additional concrete shall be delivered until the cause of the deficiency is determined and corrected.
- B. Air Content Tests: Tests to determine air content of fresh concrete shall be taken twice daily, at least 4 hours apart and shall be performed in accordance with the applicable ASTM Standards.
- C. Strength Tests
 - 1. Number of tests required. Unless otherwise required, a minimum of one strength test shall be made for each 50 cubic yards or fraction thereof for each mix design of concrete placed in any one day, except that in case shall a given mix design be represented by less than 5 tests.
 - 2. Sample collection and storage: Sampling of fresh concrete shall be in accordance with ASTM C172. Laboratory and field test cylinders shall be made and, for the first 24 hours, cured and stored in a tightly constructed, firmly braced wooden box, constructed to maintain the temperature immediately adjacent to the specimens in range of 60 degrees F. to 80 degrees F. and prevent loss of moisture from the specimens. The storage temperature shall be thermostatically controlled when necessary.
 - a. Loss of moisture shall be prevented by covering cylinders with wet burlap, damp sand or other approved means. Test cylinders cast in cardboard molds shall not be stored in contact with wet burlap, damp sand or any other material that will allow the outside surfaces of the mold to absorb water for the first 24 hours. Cylinders shall be removed from storage after 24 hours, and after removal of molds, the laboratory-cured cylinders shall be stored in a moist condition in the laboratory at a temperature of 65 degrees F. to 75 degrees F. until the time of the test. The field-cured cylinders shall be removed from storage after 24 hours and stored in the structure as near the point of sampling as

practicable, with the same protection on all surfaces as the structure which they represent.

3. Testing: Cylinders shall be tested in accordance with ASTM C39. Each strength test will consist of 2 laboratory-cured and 1 field-cured cylinders. Two laboratory-cured cylinders and one field cured cylinder shall be tested at 28 days.
4. Testing Laboratory: The Contractor shall employ an independent Testing Laboratory for testing. The cost shall be included in the lump sum bid price. The Contractor shall assist the testing laboratory whenever necessary to accomplish the required tests.
5. Strength requirements: The average strength of the test cylinders for any portion of a structure shall be equal to or greater than the strength specified, and at least 90 percent of all tests shall indicate a strength equal to or greater than the strength specified. In cases where the average strength of the test specimens for any portion of the structure falls below the specified requirements, the City shall order a change in the mix proportions or water content for the remaining portion of the Work and shall require the Contractor to secure test specimens of the hardened concrete represented by these cylinders. The number of test cylinders for each concrete placement shall be as directed by the City. Specimens shall be secured and tested in accordance with ASTM C42.
6. Failure to achieve required strength: If the specimen tests further substantiate that the concrete represented by the cylinders and specimens is below the specified strength requirements, the concrete shall be removed and replaced at the expense of the Contractor.

END OF SECTION 03300

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SECTION 09930

WELDED STEEL PIPE COATINGS

PART 1 - GENERAL

1.01 SUMMARY

A. SCOPE

1. This specification covers the minimum requirement for the internal and external application of shop applied corrosion resistant coatings to the welded steel pipe.
2. The work includes: furnishing of all plant labor, materials, tools, and equipment; and the performance of all operations and incidentals necessary for the coating, handling, and storage of the pipe, both bare and coated.

B. RELATED SECTIONS

1. 01600 – Materials and Equipment
2. 02511 – Welded Steel Pipe
3. 02520 – Horizontal Directional Drilling (HDD)
4. 13110 – Cathodic Protection

1.02 QUALITY ASSURANCE

- A. The coating manufacturer shall provide a representative to visit the jobsite at intervals during surface preparation and painting as may be required for product application quality assurance, and to determine compliance with manufacturer's instructions and these Specifications, and as may be necessary to resolve field problems attributable to, or associated with, the manufacturer's products furnished under this Contract.
- B. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise required by the Contract Documents.
1. ANSI/AWS B2.1 – Specification for Welding Procedure and Performance Qualification.
 2. ANSI/AWS D1.1 – Structural Welding Code - Steel.
 3. ANSI/API 5L – Specification for Line Pipe
 4. AWWA C206 – Field Welding of Steel Water Pipe.
 5. AWWA C207 – Steel Pipe Flanges for Waterworks Service - Sizes 4 In. Through 144 In.
 6. AWWA C208 – Dimensions for Fabricated Steel Water Pipe Fittings.
 7. AWWA C210 – Liquid Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.
 8. AWWA C213 – Fusion Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines
 9. AWWA M11 – Steel Pipe - A Guide For Design and Installation, 3rd. Edition.
 10. ASME Section IX – International Boiler & Pressure Vessel Code: Welding and Brazing Qualifications
 11. NSF/ANSI 61 – Drinking Water System Components
 12. SSPC – Steel Structures Painting Council
- C. Preparation and application shall be in accordance with the manufacturers' written and printed instructions and approved by the Engineer.

D. Inspections:

1. The Contractor shall give the Engineer a minimum of 15 working days advance notice of the start of any surface preparation work or coating application work. All such work shall be performed only in the presence of the Engineer, unless the Engineer has granted prior approval to perform such work in his absence. The inspector shall have access to the construction site and those parts of all plants that are concerned with the performance of work under this standard.
2. For all coatings subject to immersion, full cure must be obtained for the completed system. Consult the coatings manufacturer's written instructions for these requirements. The coating shall not be immersed for any purpose until completion of the curing cycle.
3. Inspection by the Engineer, or the waiver of inspection of any particular portion of the work, shall not be construed to relieve the Contractor of his responsibility to perform the work in accordance with these Specifications.

E. Paint/Coating Delivery and Storage

1. All materials shall be new and shall be delivered to the applicator's plant and/or project site, when required, in unopened containers that plainly show, at the time of use, the designated name, date of manufacturer, color, and name of manufacturer. Paints/coatings shall be stored in a suitable protected area that is heated or cooled as required to maintain temperatures within the range recommended by the manufacturer. Paint/coating materials shall be kept sealed when not in use.

F. Shipping and Handling

1. In all cases where pre-coated items are to be shipped to the jobsite, all efforts will be made to protect the coating from damage. Coated items shall be battened to prevent abrasion. Contractor shall use nonmetallic or padded slings and straps in handling. Items will be rejected for excessive damage, in the opinion of the Engineer.

1.03 SUBMITTALS:

- A. Submittal shall be in accordance with Section 01330-Submittals of the specifications.
- B. Factory-Applied Coatings: Submit to the Engineer for review, manufacturer's certification that states factory applied coating system meets or exceeds requirements specified herein.
- C. Data Sheets: For each paint/coating system used herein, the Contractor shall obtain from each paint/coating/lining manufacturer for submittal to the Engineer, a Paint System Data Sheet (PSDS) and Technical Data Sheets, for each product used in the paint/coating system, except for products applied by equipment manufacturers. The required information shall be submitted on a system-by-system basis. The Contractor shall also provide copies of the paint/coating system submittals to the coating applicator. A sample PSDS form is appended at the end of this section.

PART 2 - PRODUCTS

2.01 STEEL PIPE EXTERIOR COATING MATERIAL

A. Shop Coating Application

1. Fusion Bonded Epoxy
 - a. The external surface of the pipeline shall be shop coated with Fusion Bonded Epoxy (FBE) Powder Coating. FBE shall be one-part, heat curable, thermosetting epoxy

coating designed for corrosion protection of pipe. Coating thickness shall be 15-20 mils.

- b. Approved Manufacturers:
 - 1) Scotchkote 6233 manufactured by 3M, St. Paul, MN
 - 2) Valspar PipeClad 2000 FBE manufactured by Valspar Corporation, Minneapolis, MN
 - 3) Approved Equal
- 2. Abrasion Resistant Overlay (ARO)
 - a. A secondary coating of ARO shall only be applied over the fusion bonded pipeline coating on the external surface of the pipeline where the pipeline is directionally drilled. ARO shall be an epoxy based polymer concrete used to protect fusion bonded epoxy during boring and drilling and pull back operations. Coating thickness shall be 30-40 mils.
 - b. Approved Manufacturers:
 - 1) Powercrete "J" manufactured by Power Lone Star, Inc., Tulsa, OK
 - 2) Valspar PipeClad 2040 ARO manufactured by Valspar Corporation, Minneapolis, MN
 - 3) Approved Equal

B. Welded Joint Field Coating Application

- 1. Liquid Epoxy Coating
 - a. For field coating of welded steel joints, utilize a two-part liquid epoxy resin coating for the initial replacement of the fusion bonded epoxy. The epoxy resin must be allowed to cure in accordance with the manufacturer's recommendations.
 - b. Approved Manufacturers:
 - 1) Scotchkote 323 manufactured by 3M, St. Paul, MN
 - 2) Approved Equal
- 2. Abrasion Resistant Overlay (ARO)
 - a. Once the epoxy layer is cured, a second layer of abrasion resistant overlay (ARO) is to be applied in accordance with manufacturer's recommendations.
 - b. Approved Manufacturers:
 - 1) Powercrete "J" manufactured by Power Lone Star, Inc., Tulsa, OK
 - 2) Approved Equal
- 3. Both field applied liquid epoxy and ARO applications shall be applied to the same layer thickness as the shop coated specifications.

2.02 STEEL PIPE INTERIOR COATING MATERIAL

A. Interior Pipe Coating Application

- 1. General: The internal surface of the pipeline shall be shop coated with a two-part liquid epoxy coating in accordance with the following:
- 2. Pipe coating must meet the requirements of NSF Standard 61 for use as a coating in contact with potable water. Coating thickness shall be 15 mils.
- 3. Approved Manufacturers:
 - a. Scotchkote 162PWX manufactured by 3M, St. Paul, MN
 - b. Approved Equal

B. Welded Joint Field Coating Application

- 1. General: For field coating of welded steel joints, utilize a two-part liquid epoxy resin coating compatible with shop coated liquid epoxy. Field applied epoxy on the internal surface of the pipeline must meet the requirements of NSF Standard 61 for use as a coating in contact with potable water.

2. Approved Manufacturers:
 - a. Scotchkote 323 manufactured by 3M, St. Paul, MN
 - b. Approved Equal

PART 3 - EXECUTION

3.01 GENERAL

- A. Coatings to be utilized for field coating applications shall be brought to the job site in originally sealed and labeled containers of the coating manufacturer and shall be subject to inspection by the Engineer on the project.
 1. Store coatings inside, protect against freezing.
 2. No adulterant, unauthorized paint thinner or other material not included in the paint formulation shall be added to the coating for any reason.
 3. No coating shall be installed below the recommended temperature or above the recommended temperature and shall dry with the recommended dry time
- B. Prior to applying coatings, surfaces shall be cured, dry, clean, free of grease or foreign material, and properly sandblasted, ground, pores filled or sanded, in accordance with the Section 3.03 Surface Preparation.
- C. Coatings shall be applied in accordance with the Manufacturer's recommendations and at such times as approved by the Engineer. All pipes shall be empty when coated. If dew or moisture conditions are prevalent, delay application until the temperature of the surface to be coated is 5 degrees F above the dew point and the surfaces are dry. Provide dehumidifying or heating equipment, at no additional cost to the Owner, if needed to prevent sweating.
- D. Thoroughly mix epoxy coating as per manufacturer's recommendations. All mixed epoxy coating shall be used and applied prior to curing. Thoroughly mix coating material each time any is withdrawn from the container.
- E. Coatings shall be applied in strict accordance with the manufacturer's instructions and shall be performed in a manner satisfactory to the Engineer. The application of each coat shall be at the rate required to achieve at least the minimum dry mil thickness specified herein.
- F. No new coat shall be applied until after the recommended dry time. Under no condition shall additional coats be applied until the preceding coat has had sufficient dry time. Dry time may vary per the temperature.
- G. It shall be the Contractor's responsibility to ensure that all surfaces are properly prepared, the proper primer applied to the correct mil thickness, and the finish coat is compatible with the primer coat and applied to the correct mil thickness. This applies to all material, whether the total process is done in the shop or in the field, or partially in shop and partially in the field.

3.02 HANDLING OF SHOP COATED PIPE

- A. At the project site, the pipe shall not be handled with metal chains cables, unpadded tongs, forklifts or other equipment likely to cause damage to the pipe shop coating or score the pipe surface.
- B. Storing of the pipe shall be on padded 12-inch wide (minimum) skids or select loamy or sand

dirt berms, where possible. In urban areas, pipe should be suspended on padded skids. Where skid chucks are used in contact with the pipe, they should be padded with several layers of padding material. Padded chucks should be placed such that pipe is nested on the skid rather than the chuck. The coated pipe shall not be laid on pavement without benefit of padding at contact points.

- C. If cables or chains are used during transportation, they must be properly padded with approved, suitable material as required to protect the pipe and shop coated surface from damage while in transit. Use of a padded horizontal separator strip between successive rows of pipe is necessary to prevent damage to the pipe surface.
- D. At all times during construction of the pipeline, the Contractor shall take every precaution to prevent damage to the protective shop coating and scoring of the pipe surface. No metal tools or heavy objects shall be permitted to come into contact unnecessarily with the pipe surface.

3.03 SURFACE PREPARATION

- A. All surfaces to be coated shall be prepared in accordance with the manufacturer's instructions, with the objective of obtaining a smooth, clean, and dry surface. No coating shall be applied before the prepared surfaces are approved by the Engineer.
- B. All ferrous metals requiring coating shall have rust, dust, scale, and any other foreign substance removed to a SSPC SP-10, "NEAR WHITE" finish by sandblasting, except for ARO applications. Regardless, whether the ferrous metal is to be shop or field primed or is coated with ARO over the fusion bonded coating, the cleaned surfaces shall be free of any material which would cause improper bond of the coating. Cleaned metal shall be primed the same day that it is cleaned to prevent new rust from forming.

3.04 COATING

- A. Apply coating to ferrous metals. Items to be coated include, but are not limited to:
 - 1. Section of the new pipeline that that is buried or directionally drilled, as shown on the plans.
- B. Any material that is to be coated, and receives a coat of flash rust, shall be re-prepared to a SSPS No. 10, "NEAR WHITE" surface; the contractor is encouraged to coat the pipe as soon as possible after sandblasting.
- C. Coating shall be of the type as manufactured for the purpose intended and shall be applied in accordance with the manufacturer's instructions to the surfaces in such a manner as indicated in the following schedule. Any material which is properly shop primed does not need to be field primed unless the shop primer is damaged, in which case the damaged area shall be properly cleaned and the indicated field primer applied. The field primer indicated in the schedule shall also be applied to all material which is not shop primed.

3.05 SHOP APPLICATION OF FUSION-BONDED EPOXY COATING

- A. Apply lining and coating per AWWA C213 except as modified herein
- B. Grind 0.020-inch (minimum) off the weld caps on the pipe weld seams before beginning the surface preparation and heating of the pipe.

- C. Grind surface irregularities, welds, and weld spatter smooth before applying the epoxy. The allowable grind area shall not exceed 0.25 square foot per location, and the maximum total grind area shall not exceed 1 square foot per pipe section. Do not use any pipe section in which these requirements cannot be met.
- D. The coating shall have a cutback of not more than two (2) inches measured from the end of the pipe end. Sealing of the ends of the pipe with tape is an acceptable method to achieve the cutback, as long as it does not leave a residue on the pipe surface detrimental to the bond of the subsequently applied field joint.
- E. Grind outside sharp corners, such as the outside edges of flanges and harness plates, to a minimum radius of ¼ - inch.
- F. Uniformly preheat the pipe prior to blast cleaning to remove moisture from the surface. The pre-heat shall be sufficient to ensure that the pipe temperature is at least 5 degrees F above the dew point temperature during blast cleaning and inspection.
- G. Sandblast surfaces per SSPC SP-5. Protect beveled pipe ends from the abrasive blast cleaning.
- H. Apply a phosphoric acid wash to the pipe after sandblasting. The average temperature of the pipe, measured in three different locations, shall be 80 degrees F to 130 degrees F during the acid wash procedure. The acid wash shall be a 5% by weight phosphoric acid solution. The duration in which the acid is in contact with the pipe surface shall be determined by using the average pipe temperature as tabulated below:

Pipe Temperature (Degrees F)	Contact Time (seconds)
80	52
85	45
90	36
95	33
100	28
105	24
110	21
130	10

After the acid wash has been completed, remove the acid from the pipe with demineralized water having a maximum conductivity of 5 micro ohms/cm at a minimum nozzle pressure of 2,500 psi.

- I. Apply epoxy coating by either the electrostatic spray or fluidized bed process. Minimum thickness of coating shall be 15 to 20 mils each, except for grooved end pipe surfaces. Heat and cure in accordance with epoxy manufacturer's recommendations. The heat source shall not leave a residue or contaminant on the metal surface. Do not allow oxidation of surfaces to occur prior to lining and coating. Do not permit surfaces to flash rust before coating.

3.06 SHOP APPLICATION OF ARO

- A. When the primary coating has been applied less than six (6) days prior, the surface shall be cleaned and free of all contaminants. If solvent is used, it shall be without residue. Following cleaning, the coating shall be examined for U.V. degradation (fading or crazing).
- B. If the primary coating was applied six (6) or more days prior and the coated pipe was exposed to sunlight (or other U. V. source) the U. V. affected FBE surface shall be removed before ARO can be applied. The damaged surface shall be removed by lightly blasting (sweep blasting) with an air or rotary blaster using an appropriate angular material (not shot). As an alternative to blasting, the coating shall be thoroughly abraded using an abrasive coated organic pad, equivalent to 3M scrubbing pad or medium grit emery cloth. Following blasting or abrading, the FBE coating shall be thoroughly cleaned using compressed air or water. If water is used on the coated pipe, the pipe shall be completely dry.
- C. Following cleaning, no dust or other particles shall be visible on the surface of a clear adhesive tape that has been pressed on the surface of the FBE coating and removed for observation.
- D. The coating shall have a cutback of not more than two (2) inches measured from the end of the pipe end. Sealing of the ends of the pipe with tape is an acceptable method to achieve the cutback, as long as it does not leave a residue on the pipe surface detrimental to the bond of the subsequently applied field joint.
- E. Immediately prior to the application of ARO, the primary pipe coating shall be 100% inspected for holidays, pinholes, and other damage, subject to the same procedure for holiday inspection of the original coating. The repair procedure for discontinuous primary coating shall be identical to the repair during application of the original coating.
- F. The pipe shall be preheated to ensure that no surface moisture is present during the actual coating application. Under no conditions shall the coating be applied to a pipe surface temperature above 160°F (71°C).
- G. The freshly coated areas shall be protected from being contaminated with dust or other foreign debris. Excessive particle contamination shall require stripping, re-blasting, and recoating.
- H. Pipe shall be coated immediately after heating using a spray gun or other methods acceptable to the Engineer.
- I. The first layer shall be applied uniformly to a thickness that will not cause running of material. Application shall be facilitated with a hand trowel or other tools if necessary.
- J. Successive layers of 20-40 mils shall be applied allowing 10 minutes between applications until a minimum thickness of 40 mils is achieved.
- K. Cured coating shall be of uniform color, gloss, and thickness and shall be free of blisters, pinholes, fish eyes, sags, pimples, craters, and other irregularities. It is understood that contact with moisture after application may cause discoloration without affecting the quality of the coating.

- L. The ARO coating shall reach a minimum hardness of 65 (Type D Durometer—ASTM D2240) prior to handling.
- M. The ARO coating shall reach a minimum hardness of 65 (Type D Durometer—ASTM D2240) prior to installation.
- N. Any joint of pipe having less than the specified minimum hardness shall, at the Owner's option be retested after 24 hours, or have the defective coating removed and reapplied as per this specification.
- O. All work done under this specification shall be subject to inspection and acceptance by the Owner's Representative or Engineer. All parts of the Coating Applicator's facilities associated with this work shall be accessible to the inspector. The Coating Applicator shall correct work which is found defective under this specification or within the obvious intent of this specification.
- P. The Coating Applicator's quality control inspector shall advise the Applicator's foreman when conditions exist which adversely affect the coating operation with respect to cleaning, application, or material performance, so that immediate corrective measures can be taken.

3.07 SHOP TESTING OF COATING APPLICATIONS

- A. Test coating with a low-voltage wet sponge holiday detector in accordance with AWWA C213, Section 5.3.3. If the number of holidays or pinholes is fewer than one per 10 square feet of coating surface, repair the holidays and pinholes by applying the coating manufacturer's recommended patching compound to each holiday or pinhole and retest. If the number of holidays or pinholes exceeds one per 10 square feet, remove the entire pipe lining and coating and recoat the entire piping and retest.
- B. Check for coating defects on the weld seam centerlines. There shall be no porous blisters, craters, or pimples lying along the peak of the weld crown.
- C. Measure the coating thickness at three locations on each pipe section using a coating thickness gauge calibrated at least once per eight-hour shift. Record each measured thickness value. Where individual measured thickness values are less than the specified minimum thickness, measure the coating thickness at 6-inch intervals along the pipe length. The average of these measurements shall exceed the specified minimum thickness value, and no individual thickness value shall be more than 2 mils below or 3 mils above the specified minimum value. If a section of pipe does not meet these criteria, remove the entire lining and coating and recoat the entire pipe section or fitting.
- D. The Engineer, will conduct in the field inspections of the coating for compliance with the above criteria at any time. Coated items failing his inspection will be cause for rejection.

3.08 COATING FIELD WELDED JOINTS AND FIELD REPAIRS TO COATINGS

- A. Field Applied Epoxy:
 - 1. Patch scratches and damaged areas incurred while installing fusion-bonded epoxy pipe with a two-Component, 80% solids (minimum), liquid epoxy resin. Wire brush or sandblast the damaged areas per SSPC SP-10. Lightly abrade or sandblast the pipe lining and coating on the sides of the damaged area before applying the liquid epoxy coating.

Apply the liquid epoxy coating to damaged linings and coatings to areas smaller than 20 square inches. Patched areas shall overlap the parent or base coating a minimum of 1/2-inch. If a damaged area exceeds 20 square inches, remove the entire pipe lining and coating and recoat the entire piping and retest. Apply the liquid epoxy coating to a minimum dry-film thickness of 15 mils.

B. Field Applied ARO:

1. All damage detected by visual inspection shall be repaired by the Applicator. Scars, dents, damaged areas, and large holidays shall be cleaned by removing all rust, scale, dirt or other foreign material and loose coating by using hand or power driven wire brush. The area to be patched (holiday plus at least 3/4 inch {19 mm} of surrounding coating) shall be suitably roughened before patching with 120 grit "wet" or "dry" sandpaper or similar. Files shall not be used. Dust generated by the sanding shall be removed with a clean, dry cloth or brush prior to patching. Areas not meeting hardness requirements shall be removed using a method that will not damage the primary coating or pipe.
2. Patching ARO holidays and damaged coatings with ARO material specified by the ARO's manufacturer or with liquid epoxies that are compatible with the selected ARO. In all cases, end user specification shall supersede this specification. The surface to be patched shall be heated with a small torch until it is thoroughly dry. The ARO repair material shall be mixed and applied over the heated surface. Patches shall overlap the surrounding undamaged coating by a minimum of 3/4 inch. Repairs shall be inspected at the discretion of the Engineer. Apply the ARO repair material to a minimum thickness of 40 mils.

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APPENDICES

- APPENDIX A: Substance Abuse and Drug-Free Workplace Ordinance
- APPENDIX B: Procurement Information Form
- APPENDIX C: Norfolk Modifications to HRPDC Regional Standards, 5th Edition
- APPENDIX D: Pay Item Descriptions
- APPENDIX E: SWPPP for Contractor Use
- APPENDIX F: Project Sign Detail
- APPENDIX G: “*NOT USED*”
- APPENDIX H: Soil Borings
- APPENDIX I: Test Hole Results (Pipe)
- APPENDIX J: Contractor’s Use of Temporary Facilities and Staging Areas
- APPENDIX K: 8-Inch Blow-off Valve Replacement Information
- APPENDIX L: Host City Approvals
- City of Portsmouth, - Wetlands Review Exclusion Letter
 - City of Portsmouth, Site Plan Approval
 - City of Chesapeake, Site Plan Approval
- APPENDIX M: Regulatory Agency Approvals
- Virginia Marine Resources Commission
 - U.S. Army Corps of Engineers

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APPENDIX A

Substance Abuse and Drug-Free Work Place Ordinance

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2/6/96 'SB'
Form and Correctness Approved:

By Philip J. Depina
Office of the City Attorney

Contents Approved:

By [Signature]
DEPT.

NORFOLK, VIRGINIA

ORDINANCE No. 38,261

R-1

AN ORDINANCE TO AMEND AND REORDAIN CHAPTER 33.1 OF THE NORFOLK CITY CODE, 1979, BY ADDING ONE NEW SECTION NUMBERED 33.1-58 ENTITLED SUBSTANCE ABUSE AND DRUG-FREE WORK PLACE POLICY FOR CITY CONSTRUCTION CONTRACTS.

- - -

WHEREAS, the City of Norfolk has pledged to maintain a Substance Abuse and Drug-Free Work Place; and

WHEREAS, the City of Norfolk intends to extend this policy to contractors engaged through the City's procurement process and are the recipients of public funds, therefore,

BE IT ORDAINED by the Council of the City of Norfolk:

Section 1:- That Chapter 33.1 of the Norfolk City Code, 1979, is hereby amended and reordained by adding one subsection numbered 33.1-58 which shall read as follows:

Sec. 33.1-58. Substance Abuse and Drug-Free Work Place Policy for City Construction Contracts.

Every bid response for a construction project solicited on or after March 1, 1996, shall include, by reference or incorporation, legally defensible, written substance abuse policies which shall be in effect during the period of performance of the contract. Notwithstanding the aforesaid, every contract as declared by the Director of Public Works entered into on or after March 1, 1996, shall include, by reference or incorporation, legally defensible, written substance abuse policies which shall be in effect during the period of performance of the contract. The substance abuse policy shall include all workers who will perform on City of Norfolk projects both general and sub-contractors. Said policies shall include, but not be limited to, the following requirements:

(a) Drug testing by a state approved laboratory licensed to conduct such tests in accordance with standards established by the National Institute On Drug Abuse (NIDA). Drugs to be tested for shall be as follow:

- (1) Amphetamines/Methamphetamine (e.g., crystal and speed);
- (2) Cocaine and Crack Cocaine;
- (3) Opiates (e.g., Codeine, Heroin, Morphine, Hydromorphone, Hydrocodone);
- (4) Phencyclidine (PCP); and
- (5) Marijuana (THC).
- (6) Alcohol.

(b) Drug testing will be conducted on the employee(s) by and at the expense of the employer before the employee(s) is/are allowed to visit and/or work on any job site.

(c) Random drug testing shall be required. The criteria for random testing should be based upon the function(s) performed by the employee, particularly those functions in which a momentary lapse could cause death, serious bodily injury or destruction of property.

(d) Testing upon reasonable suspicion is required. For purposes of this section, "reasonable suspicion" means - an articulable belief based on specific facts, and reasonable inferences, drawn from those facts, that an employee is under the influence of drugs or alcohol. Circumstances which constitute a basis for determining reasonable suspicion may include, but are not limited to:

- (1) a pattern of abnormal or erratic behavior (e.g. hyperactivity, unexplained mood swings, paranoia, hallucinations);
- (2) information provided by a reliable and credible source;
- (3) a work-related accident;
- (4) direct observation of drug or alcohol use;
- (5) possession of drugs or drug paraphernalia; or
- (6) presence of the physical symptoms of drug or alcohol use (e.g., glassy or bloodshot eyes, odor of alcohol on breath, slurred speech, needle marks/scar tracks on arms, unusual drowsiness or sluggishness).

(e) Written notice of the testing policy is required to be given to all employees by the employer.

(f) A consent form shall be executed authorizing the drug and/or substance abuse testing and permitting the release of tests results to the employer to be used to prove compliance with drug and/or substance abuse policies. Test results for all personnel working pursuant to a City of Norfolk contract will be made available to the City on a confidential basis.

(g) A refusal to consent section will be required which specifically informs the employee that refusal to consent to a drug and/or substance abuse test will be grounds for preventing the employee from working on City of Norfolk contracted work.

(h) Confirmation of positive test results through at least one additional test is required.

(i) Confidentiality of tests results, except as exempted by other sections of this section, is required as part of any drug and/or substance abuse policy adopted pursuant to this section.

(j) An employer is required to notify the City of Norfolk of any employee who is arrested or convicted for drug related offenses as stipulated in this section as soon as such information is known to the employer.

(k) A section stipulating that searches may be conducted of all areas and property jointly controlled by the employee(s) and the employer, or fully controlled by the employer, is required.

(l) A severability section stating that each provision of the drug and/or substance abuse policy is severable from other sections and provisions of the policy and, if found to be illegal by a Court, such invalidity shall not affect the validity of the other sections or provisions.

(m) No contractor shall allow any employee to engage in work on a City of Norfolk project upon notification of a positive test result unless and until the employees is certified to be drug free.

(n) That the City Manager is hereby authorized to take all actions necessary to implement the aforesaid provisions including, defining terms, establishing reports and forms and establishing deadlines for the production of information.

Section 2:- That this ordinance shall be in effect from and after its adoption.

Adopted by Council February 6, 1996
Effective February 6, 1996

TRUE COPY
TESTE:

R. BRECKENRIDGE DAUGHTREY, CITY CLERK

BY: DEPUTY CITY CLERK

APPENDIX B

Procurement Information Form

*36-Inch Raw Water Main Improvements-
Replacement of Western Branch
Elizabeth River Crossing (Line 2)
February 2015
City of Norfolk, Department of Utilities*



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**CITY OF NORFOLK
DEPARTMENT OF UTILITIES
PROCUREMENT INFORMATION FORM**

In an effort to document the extent of our minority and Norfolk procurement activities, the Department of Utilities, Division of Engineering, P. O. Box 1080, Norfolk, VA 23501, requests that you complete this form and return it to us with the signed construction contract or professional services agreement. This information will be used for statistical purposes only.

PROJECT NAME: _____

FIRM'S NAME: _____

1. What is your firm's minority status (based on the Federal or State criteria)?
 - 1a. Please circle the alpha description that applies to your firm. Is the majority ownership of the firm:
 - a) African American male owned b) African American female owned
 - c) White female owned d) Other female owned
 - e) Hispanic f) Eskimo
 - g) Asian American h) American Indian
 - i) Aleut
2. Does your firm intend to use minority firms in conduction the work? ___Yes ___No. If yes, please list the minority firm's name and dollar value of the work.

FIRM'S NAME

DOLLAR VALUE

3. Please state your firm's intention to procure materials from minority firms and the dollar value of those procurements.

FIRM'S NAME

DOLLAR VALUE

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4. Please list the dollar value of your firm's minority payroll for the project (to be provided quarterly).

1st Quarter

2nd Quarter

3rd Quarter

4th Quarter

5. Please list the dollar value of the firm's payroll for the project paid to Norfolk residents (to be provided quarterly).

1st Quarter

2nd Quarter

3rd Quarter

4th Quarter

6. What is the dollar value of your firm's procurement for project materials and services from firms located in Norfolk?

FIRM'S NAME

DOLLAR VALUE

I certify that the above information is correct to the best of my knowledge, as of the below date.

Signature: _____ Date: _____

Title: _____

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APPENDIX C

Norfolk Modifications to HRPDC Regional Standards, 5th Edition

*36-Inch Raw Water Main Improvements-
Replacement of Western Branch
Elizabeth River Crossing (Line 2)
February 2015
City of Norfolk, Department of Utilities*



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THE CITY OF NORFOLK MODIFICATIONS TO HRPDC REGIONAL STANDARDS, 5th Edition

Section	Sub-Section	Name	Add/ Delete	Modification
All Sections Sections 200 - 800		Measurement for Payment.	Replace	See Appendix D for City of Norfolk Department of Utilities Measurement and Payment Item Descriptions. Replace all references to Measurement for Payment in the technical specifications with Appendix D.
109	XI	Standard Bid Items and Units	Delete	Use City of Norfolk Measurement and Payment descriptions. Refer to Appendix D.
All 100 sections		General Provisions	Replace	Revise all HRPDC General Provisions with Norfolk City Modifications and Department of Utilities Modifications
200	II.2.2	Quality Assurance	Add	Norfolk Arboricultural Specifications and Standard Practice Manual
	III.3.6	Submittals	Add	Add the following sentences: "Requests for substitutions shall be submitted at the pre-construction meeting and must be approved in writing by the Engineer prior to the start of any construction."
	V.5.10.A.9	Ductile Iron Pipe	Add	Ductile Iron pipe shall have Protecto 401 ceramic epoxy lining, or equal hydrogen sulfide resistant lining approved by the Department.
	V.10.B.5	PVC Pipe	Modify	Correct the second sentence to read: "When Compact fittings are used, they shall have a minimum acceptable pressure rating of 350 psi."
	V.5.10.D.	HDPE Pipe	Delete	HDPE shall not be used
	V.5.10.E.1.a.b	Valves	Delete	Delete "with threaded connections" from the first sentence.
	V.5.10.E.1.a.c	Valves	Add	Accessories: Provide zinc plated bonnet bolts, studs and nuts for unsubmerged service. Provide stainless bonnet bolts, studs and nuts for submerged service. Make wedging devices bronze to iron or bronze to bronze. Provide glands which are bronze or bronze bushed and bronze gland bolts and nuts.
	V.5.10.E.1.c	Valve Operators	Delete	"A valve key wrench of adequate length and of each type required shall be provided for each project."
	V.5.10.E.1.d	Valve Stem Extensions	Delete	Strike out section
	200	V.5.10.E.3.	Check Valves	Add
	V.5.10.G.3.c	Joint Restraint Devices	Add	Harnessing: For ductile-iron pipe and fittings with mechanical joints that require harnessing, provide ductile-iron mechanical joint retainer glands.

THE CITY OF NORFOLK MODIFICATIONS TO HRPDC REGIONAL STANDARDS, 5th Edition

Section	Sub-Section	Name	Add/Delete	Modification
200	V.5.10.G.4.c	Joint Restraint Devices	Add	Harnessing: For PVC joints requiring harnessing, provide Series 1300/1390 restraining fittings as manufactured by Uni-flange, Corp., Series 1110 HV and Series 2000 PV as manufactured by EBAA Iron Sales, Inc., or equal.
	V.5.11.A.5	Ductile Iron Pipe Fittings	Modify	Correct the second sentence to read: "When Compact fittings are used, they shall have a minimum acceptable pressure rating of 350 psi."
	V.5.11.A.7.a	Ductile Iron Pipe Fittings	Add	After ANSI/AWWA add "Current department approved linings include Protecto 401 ceramic epoxy lining. Other hydrogen sulfide resistant linings shall be submitted for review and approval as equal".
	V.5.11.B.8	PVC Pipe Fittings	Add	Add paragraph "For Mains installed, where cover is 10' (ten feet) or greater, the pipe shall be C900/C905 DR 18 or Ductile Iron."
	V.5.11.B.9	PVC Pipe Fittings	Add	Add paragraph "All fittings shall be molded or ductile iron. No fabricated fittings will be allowed."
	V.5.19.A.5	Ductile Iron Pipe fittings	Modify	Correct the second sentence to read: " When Compact fittings are used, they shall have a minimum acceptable pressure rating of 350 psi."
	V.5.19.B.3.	PVC Pipe	Delete	"couplings, and fabricated fittings" and "or fitting".
	V.5.19.B.6	PVC Pipe	Add	Add as the final sentence in the paragraph: "Where Schedule 80 PVC is used, solvent cement shall meet the requirement of ASTM D-2564."
	V.5.19.B.7.	PVC Pipe	Delete	Strike out paragraph
	V.5.19.E	Copper Water Pipe	Delete	Strike the sentence that starts, "Fittings shall be wrought..."
	V.5.19.F.1.c.	Valves	Delete	Strike out "with threaded connections".
	V.5.19.F.1.d.	Valves	Add	All gate valves for water shall open right (clockwise).
	V.5.19.F.3.a	Butterfly Valves	Modify	Replace "16 inches" with "20 inches".
	V.5.19.F.1.d.	Valve Operators	Modify	Strike out the sentence that begins, "A valve key wrench..." Add the following: "NOTE: Water valves open right (clockwise)."
	V.5.19.F.5.	Valve Stem Extensions	Delete	Strike out paragraph
	V.5.19.H.2.	Fire Hydrants	Delete	"The fire hydrant shall be painted with a high gloss, alkyd industrial enamel (colors to be selected by Owner)".
	V.5.19.H.3	Fire Hydrants	Delete	Strike out paragraph
	V.5.19.H.6	Fire Hydrants	Delete	Strike out paragraph
	V.5.19.H.7	Fire Hydrants	Add	"All fire hydrants shall be manufactured in complete accordance with American Water Works Association Specification C502, latest revised edition, and shall be as manufactured by the Darling Valve & Manufacturing Company (Model B-50-B), Mueller Centurian A-421, Pacer Model W-67, Kennedy K-81, or approved equal. Hydrants shall have full 360 degree revolving heads and shall open by turning the operating nut to the right (clockwise).
	V.5.19.K.4.a.	Concrete Reaction Blocking	Add	Add the phrase, ", or as designated by the Engineer," after the word, "Drawings".
V.5.19.K.4	Concrete Reaction Blocking	Delete	subsections b and c	

THE CITY OF NORFOLK MODIFICATIONS TO HRPDC REGIONAL STANDARDS, 5th Edition

Section	Sub-Section	Name	Add/ Delete	Modification
	V.5.19.L.2.	Tapping Valves and Sleeves	Delete	Strike out the sentence, “The valves shall be subjected to a factory test...”
	V.5.19.L.3.a.	Tapping Sleeves for DI Pipe and PVC C-900	Modify	In the first sentence insert “full bodied” between “shall be” and “mechanical joint”. Delete “in accordance with ANSI/AWWA C110/A21.10. and” from the sentence beginning with “Tapping sleeves shall be...”
	V.5.19.L.3.b.	PVC pipe (Other than C-900)	Delete	Strike out the first paragraph, which begins, “Tapping sleeves shall be complete...”
	V.5.20.B.	Subsurface Utility Warning Tape	Modify	Replace “metalized” with “non-metallic”.
	V.5.21.F.1	Manhole Rehabilitation Using Cementitious Products	Delete	Delete entire section
	V.5.21.I.2	Manhole Frame Seals	Delete	After "only be installed with" delete " the cementitious lining and"
303	II.2.2.E.1	Trench Bedding and Backfilling	Modify	Replace “Contractor” with “Inspector”.
	II.2.2.E.4.	Trench Bedding and Backfilling	Modify	Replace the paragraph with: “Backfill material shall be solidly compacted around the pipe in 6” layers up to sub-base of the roadway or the existing ground elevation. As a minimum, compact each layer of the backfill material to 95% maximum density as determined in accordance with VTM-1.
	II.2.2.E.7.	Trench Bedding and Backfilling	Modify	Replace in the first sentence, "...material to not less than the following percentages at the maximum..." with "...material to 95% maximum...".
	II.2.2.E.7.	Trench Bedding and Backfilling	Delete	sub sections “a – c”.
	II.2.2.E.7.G.	Trench Bedding and Backfilling	Add	<p>“The City may, at any time, require compaction testing to ensure compliance with the specifications. A recognized testing laboratory that is selected by the City will conduct all tests. The testing laboratory is to be qualified in the field of the materials to be tested. If applicable, all tests will be conducted in accordance with V.D.O.T.’S “Manual for Virginia Testing Methods” (Current Edition, as Revised). Payment for all tests will be in accordance with the following:</p> <p>A) The cost of all tests failing to meet the minimum requirements will be borne by the Contractor.</p> <p>B) The costs of all tests that either meet or exceed the minimum requirements shall be borne by the City.</p>

THE CITY OF NORFOLK MODIFICATIONS TO HRPDC REGIONAL STANDARDS, 5th Edition

Section	Sub-Section	Name	Add/ Delete	Modification	
	II.2.2.G.2.	Pavement Removal for Placement of Pipelines	Modify	Replace the sentence beginning with "The minimum requirements for a" with "Temporary paving shall be installed and maintained to provide a suitable driving surface on residential streets. Contractor shall allow dust. Acceptable daily temporary pavement shall be VDOT 21A Stone, BM-25, recycled asphalt pavement and crush concrete. Crushed concrete shall be permitted on a case by case basis. The inspector has the final decision of the acceptability of temporary paving".	
	II.2.3.	Tolerances	Delete	Complete Section	
801	II.2.2.C.7.	Pipe Installation	Modify	Replace "300" with "100"	
	II.2.2.F.	Tracer Wire	Modify	Replace "attached every 10 feet to" with "Directly on top of the pipe secure by placing acceptable Fill Material by hand."	
	II.2.2.G.	Subsurface Utility Tape	Modify	Re-write the paragraph to read, "All non-metallic water mains shall be identified by a subsurface non-metallic utility warning tape placed at an elevation of 12" above the copper tracer wire or as directed by the owner, conforming to Section 200."	
	II.2.3.A.	Valve Installation	Modify	After "direction of openings" insert the following, "(All water valves open right)". Re-write the second sentence to read, "Valves found not opening to the right, or determined to be defective by the Owner shall be rejected, removed from the site, and replaced by the Contractor at no additional cost to the Owner."	
	II.2.6.C.	Restraint	Add	After "...coating" add the following, "or as directed by the Owner."	
	II.2.7.C.	Connections to Existing Mains	Delete	Delete the sentence that begins with, "Connection shall be..."	
	II.2.7.F.4	Connections to Existing Mains	Modify	Replace the paragraph with, "Tie-ins to existing mains shall only be performed after the new main has been satisfactorily pressure tested and chlorinated. The contractor may not tie-in the new main to the existing main until after the results of the bacteriological tests have been completed and approved by the owner."	
	801	II.2.7.G.	Tapping Existing Mains Under Pressure	Delete	Delete subsections 3,4, and 6.
		II.2.7.G.5.	Tapping Existing Mains Under Pressure	Modify	Change the sentence to read, "Pressure shall be maintained for one (1) hour period without evidence of leakage."
		II.2.7.G.7.	Tapping Existing Mains Under Pressure	Add	In the first sentence, after "...branch are acceptable" add the following, "unless otherwise directed by the Owner."
II.2.8.B.1.		Pressure Test	Modify	In the sentence which begins, "Water mains shall be..." remove the portion that states, "1.5 times the expected working pressure or" and the portion that states, " ,whichever is greater".	
II.2.8.B.7.		Pressure Test	Modify	Replace this subsection with, "The test pressure shall be maintained at the pressure stated in the project specifications throughout the duration of the test period. The water used to maintain the test pressure shall be measured and shall be less than the allowable leakage in order for the main to have passed the test."	
	II.2.8.C.2.	Leakage Test	Modify	Insert the word "excess" between "...until the" and "leakage."	

THE CITY OF NORFOLK MODIFICATIONS TO HRPDC REGIONAL STANDARDS, 5th Edition

Section	Sub-Section	Name	Add/ Delete	Modification
802	II.2.1.E.	General	Add	Provide cut sheets for all manholes, 100 ft. stations and end-of-line cleanouts.
	II.2.1.F.	General	Add	All Services which are reconnected to the replaced sewer main shall be shown on the "As Built" drawings with the exact distance from the nearest manhole and with the details of the method of reconnection.
	II.2.2.C.4.	Pipe Laying	Add	"If a swab is in the pipe for cleaning, the grade shall be checked and recorded for each joint of pipe.
	II.2.2.C.6	Pipe Laying	Modify	After "...shall be closed" insert " by use of a temporary bulkhead" and delete " to the satisfaction of the Owner".
	II.2.2.D.1.	Alignment and Grade	Modify	Replace "Drawings" with "approved laying schedule".
	II.2.2.D.2.	Alignment and Grade	Delete	Entire subsection
	II.2.3.B.	Manhole Installation	Add	To the end of the second sentence after: non-shrink grout-"and coated to match surfaces of manholes."
	II.2.4.B.1.a. (5).	Pipe Testing - Gravity Lines	Add	"Contractor is responsible for uncovering and restoring spot check sites at no additional cost to the Owner."
	II.2.4.B.1.a. (8)	Pipe Testing - Gravity Lines	Modify	Replace the last sentence with, "See Section 811."
	802	II.2.5.B	Connections	Modify
II.2.6		Manhole Coating Warranty	Modify	In third line change to Final Completion.
803	II.2.2.F	Tracer Wire	Modify	Replace "attached every 10 feet to" with "Directly on top of the pipe secure by placing acceptable Fill Material by hand."
	II.2.2.G	Subsurface Utility Tape	Modify	Re-write the paragraph to read "All non-metallic water mains shall be identified by a subsurface non-metallic utility warning tape placed at an elevation of 12" above the copper tracer wire or as directed by the Owner, conforming to Section 200."
	II.2.3.A	Valve Installation	Modify	After "direction of openings" insert the following; "(All sanitary sewer valves open left)". Re-write the second sentence to read "Valves found not opening to the left, or determined to be defective by the Owner shall be rejected, removed from the site, and replaced by the Contractor at no additional cost to the Owner."
805	I.1.2.B.2	Unusual Conditions	Modify	Replace the second half of the sentence that begins, "pressure tested in place..." and ends "...and tested in place." with, " , and meets current Virginia Department of Health Sewage Collection and Treatment Regulations."
810	II.2.2.F.3	Acceptance of Cleaning Operation	Add	A television inspection shall be completed after cleaning to verify that the cleaning operation was successful. The television inspection shall be in accordance with Section 811 - Television Inspection.
811	I.1.2.D.	Submittals	Add	Overflow Prevention Plan
	I.1.2.E.	Submittals	Add	Overflow Containment and Cleanup Plan
	II.2.1.B.1.	Equipment	Add	Sewer scanner and evaluation technology, similar to the Blackhawk pipeline assessment system, is an acceptable alternative to CCTV.
	II.2.2.A.2.	Flow Control	Modify	The end of the last sentence to read, "...unless approved by the Owner in advance".

THE CITY OF NORFOLK MODIFICATIONS TO HRPDC REGIONAL STANDARDS, 5th Edition

Section	Sub-Section	Name	Add/ Delete	Modification
Standard Details	CI_08	Residential Entrance w/out Curb and Gutter	Delete	Use Norfolk Public Works/Codes Standard Driveway Entrance Detail
	DS_02	Precast Concrete Conflict Manhole	Delete	
	EW_01	Pipe Bedding Details	Delete	
	EW_02	Payment Limits Trench Excavation and Backfill	Delete	
	EW_03	Trench Width Detail for Payment of Contingent Items	Delete	
	EW_04	Typical trench Detail for HDP A (Type S) Storm Drain Pipe	Delete	
	FE_01	Typical Chain Link Fence & Gate Detail	Delete	
	LS_01	Tree Planting - Slopes	Delete	
	RC_01	Pavement Patching for Flexible Pavement	Delete	
	RC_02	Utility Locations	Delete	
	RC_03	Continous Shoulder Rumble Strips	Delete	
	WD_02	Water Service Installation Detail	Replace	Use the Norfolk Standard Detail for Typical Tap Installatioin, CW 01
	WD-03	Water Meter Box (Type I)	Replace	Use the Norfolk Standard Detail for Water Meter Box & Cover, CW 02
	WD_04	Water Meter Box (Type II)	Delete	
	WD_05	Blow Off Assembly	Replace	Use the Norfolk Standard Detail for Air Vent/ Blow-Off Valve, CWS 03
	WD_06	Fire Hydrant Setting (Type I)	Replace	Use the Norfolk Standard Detail for Fire Hydrant Installation, CW 04 and Fire Hydrant Connection, CW 05.
	WD_07	Fire Hydrant Setting (Type II)	Delete	
	WD_08	Fire Hydrant Setting (Type II)	Delete	

THE CITY OF NORFOLK MODIFICATIONS TO HRPDC REGIONAL STANDARDS, 5th Edition

Section	Sub-Section	Name	Add/ Delete	Modification
	WD_09	Temporary Manifold For Test and Chlorination	Delete	
	WD_10	Precast Concrete Vault - Non-Load Bearing	Delete	
	WD_11	Precast Concrete Vault - H2O Loading	Delete	
	WD_12	Metal Meter Vault	Delete	
	WD_13	Water Sampling Station	Delete	
	WS_01	Standard Valve Box Frame and Cover	Delete	Use the Norfolk Standard Detail for Large Valve Box Frame and Cover, CWS 01 and CWS 02 for Small Valve Box Frame and Cover.
	WS_02	Valve Setting Detail	Delete	
	WS_03	Manual Air Vent Assembly	Replace	Use the Norfolk Standard Detail for Air Vent/ Blow-Off Valve, CWS 03
	WS_04	Steel Casing Detail	Replace	Use the Norfolk Standard Detail for Water Line Casing, CWS 07A and CWS 07B
	WS_05	Standard Thrust Blocks	Delete	
	WS_06	Obstruction By-Pass Uniform Offset	Replace	Use the Norfolk Standard Detail For lowering or new construction CW06
	WS_07	Restraining Rod Detail	Delete	
	WS_08	Typical Tracer Wire Box Installation	Delete	
	SS_01	Standard Precast Concrete Manhole w/Extended Monolithic Base	Replace	Use Norfolk Standard Detail for Standard Precast Sewer Manhole, CS 03
	SS_02	Precast Concrete Shallow Manhole	Replace	Use Norfolk Standard Detail for Shallow Precast Sewer Manhole, CS 04
	SS_03	Sanitary Sewer Straddle Manhole	Delete	
	SS_04	Sanitary Sewer Interior Drop Manhole	Replace	Use Norfolk Standard Detail for Standard Precast Sewer Drop Manhole, CS 05
	SS_05	Sanitary Sewer Exterior Drop Manhole (For Existing Manhole Only)	Replace	Use the Norfolk Standard Detail for Standard D.I. Drop Connection for Existing Brick Manhole, CS 01

THE CITY OF NORFOLK MODIFICATIONS TO HRPDC REGIONAL STANDARDS, 5th Edition

Section	Sub-Section	Name	Add/ Delete	Modification
	SS_06	Sanitary Sewer Manhole Adjustment	Delete	
	SS_07	Sanitary Sewer Manhole Invert Shaping	Delete	
	SS_08	Connection into Existing Manhole	Delete	
	SS_09	Sanitary Sewer Manhole Casting (24")	Replace	Use the Norfolk Standard Detail for standard 30" manhole casting and cover C06
	SS_10	Sanitary Sewer Manhole Cover (24")	Replace	Use the Norfolk Standard Detail for standard 30" manhole casting and cover C06
	SS_11	Sanitary Service Lateral Clean Out Frame and Cover	Replace	Use Norfolk Standard Detail for Mainline Cleanout Casting and Cover, CS 10
	SS_12	Sanitary Service Lateral Clean Out Frame and Cover For Heavy Loads	Delete	
	SS_13	Sanitary Sewer Main Line Clean Out Box	Replace	Use Norfolk Standard Detail for Mainline Cleanout Casting and Cover, CS 10
	SS_14	Sanitary Sewer Service Connection	Replace	Use Norfolk Standard Detail for Typical Wye/Lateral Layout and Property Line Cleanout, CS 11
	SS_15	Dual Sanitary Sewer Service Connections	Delete	Dual Service connection not allowed.
	SS_16	Deep Sanitary Sewer Service Connection	Delete	
	SS_17	Force Main Saxophone	Replace	Use the Norfolk Standard Detail for Force Main Saxophone, CS 14
	SS_18	Force Main to HRSD Force Main	Delete	

APPENDIX D

Pay Item Descriptions

*36-Inch Raw Water Main Improvements-
Replacement of Western Branch
Elizabeth River Crossing (Line 2)
February 2015
City of Norfolk, Department of Utilities*



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Pay Item Descriptions

Item 1: Steel Water Main (HDD & Open Cut)

Payment shall be made as one **LUMP SUM (LS)** for the entire 36-inch steel water main section installed by horizontal directional drilling (HDD) and by open trench excavation, installed to the limits shown on the Contract Drawings.

Payment shall include, but not be limited to, mobilization/ demobilization, all required submittals, all drilling mud handling, pipe purchase and delivery, pipe fabrication with internal and external coatings, pilot hole boring, pre-reaming and reaming, pipe pull back and over pull, and installation of the mitered steel bends and steel flanges. The cost for all of the Contractor's means and methods to perform the HDD and open trench installation shall be included in this item. No separate payment shall be made for miscellaneous items that are impractical to quantify; but, that may reasonably be considered to be incidental to the HDD and open trench steel pipe installation.

Also included in the cost will be stakeout, furnishing of a written cut sheet, dewatering, erosion and sediment control, tree protection, traffic control, excavation, sheeting and/or shoring in accordance with OSHA regulations, pavement removal and proper disposal, clearing, grubbing, grading, care and protection of existing utilities and structures, placement and maintenance of daily temporary pavement patching, thrust protection, backfilling and compaction. Additionally the on-site properly contained temporary storage and drying of trench soils is included. Also included are cleaning, flushing, and testing. In areas where new mains are placed in soil, a minimum of 4" of clean pliable topsoil (submittal required) and vegetation that matches original vegetation in size and species are included. Saw cutting of pavement and concrete, the removal, proper disposal and complete joint-to-joint replacement of valley gutter and handicap ramps, in-kind, are also included items. With the exception of permanent paving, all easement and right of way restoration and related landscaping shall be incorporated in this item.

No payment, partial or final, will be made for any part of a raw water transmission system until that part of the system has been flushed and tested. No payment shall be made for any failed crossing. A failed crossing is considered any crossing that is installed outside of the horizontal and vertical tolerances listed in the technical specifications and drawings or any crossing that does not meet all pressure and leakage testing specified.

Item 2: Ductile Iron Water Main:

Pipe shall be measured horizontally along the centerline of the main from the centerline at the point of connection(s), or to the centerline of the plug at dead ends. Payment shall be made based on the **LINEAR FEET (LF)** of new thickness class 52 ductile pipe installed, by size. There shall be no reduction in linear feet measured for any valve, tapping sleeve and valve, or ductile iron fitting.

The unit price bid for this item shall be full compensation for the furnishing and installing of new thickness class 52 ductile iron pipe, complete and in place. Also included in the cost will be stakeout, furnishing of a written cut sheet, dewatering, erosion and sediment control, tree protection, traffic control, excavation, sheeting and/or shoring in accordance with OSHA regulations, pavement removal and proper disposal, clearing, grubbing, grading, care and protection of existing utilities and structures, placement and maintenance of daily temporary pavement patching, thrust protection, backfilling and compaction. Additionally the on site properly contained temporary storage and drying of trench soils is included. Also included are cleaning, flushing, and testing. In areas where new mains are placed in soil, a minimum of 4" of clean pliable topsoil (submittal required) and vegetation that matches original vegetation in size and species are included. Saw cutting of pavement and concrete, the removal, proper disposal and complete joint-to-joint replacement of valley gutter and handicap ramps, in-kind, are also included items. With the exception of permanent paving, all easement and right of way restoration and related landscaping shall be incorporated in this item.

No payment, partial or final, shall be made for any part of a raw water transmission system until that part of the system has been flushed, tested, and placed into service.

Item 3: Removal of Existing 36-inch Conc. RWM from Western Branch – Elizabeth River:

Payment shall be made as one **LUMP SUM (LS)** for the entire removal of approximately 800 LF of existing 36-inch Concrete Raw Water Main that is removed from the Western Branch of the Elizabeth River The unit price bid for this item shall be full compensation for excavation, removal and legal disposal of the existing 36-inch concrete pipe, fittings and/or accessories as well as the removal of one timber and steel structure supporting an existing pipe repair and all required erosion, sedimentation and environmental protective measures related to this work, in or adjacent to the river.

Included in the cost will be working in accordance with OSHA regulations, protection of existing utilities, marinas and other structures. All marina structure restoration, surface restoration and related landscaping associated with the removal of this pipe shall be included in this item.

Item 4: Ductile Iron Fittings- 36-inch:

Payment shall be based on the number of **EACH (EA)** new ductile iron fitting installed. Fittings included in this bid item are tees, bends, crosses and reducers including all accessories, complete and in place. The cost of providing any other items that may be commonly referred to as a fitting shall be included in the cost of the pipe. The unit price bid for this item shall be full compensation for the furnishing and installing of the new ductile iron fittings, complete and in place including MEGA LUGS, or other required and approved restraint methods, and restraint of the proper pipe length.

Included in the cost will be stakeout, furnishing of a written cut sheet, dewatering, erosion and sediment control, tree protection, traffic control, excavation, sheeting and/or shoring in accordance with OSHA regulations, pavement removal and proper disposal, clearing, grubbing, grading, care and protection of existing utilities and structures, placement and maintenance of daily temporary pavement patching, thrust protection, backfilling and compaction. Additionally the on site properly contained temporary storage and drying of trench soils is included. Also included are cleaning, flushing and testing. In areas where new fittings are placed in soil, a minimum of 4" of clean pliable topsoil (submittal required) and vegetation that matches original vegetation in size and species are included. Saw cutting of pavement and concrete, the removal, proper disposal and complete joint-to-joint replacement of valley gutter and handicap ramps, in-kind, are also included items. All easement and right of way restoration and related landscaping shall be incorporated in this pay item.

Item 5: Pipe Adapters and Connections:

Payment shall be based on the number of **EACH (EA)** new pipe adapter installed. Adapters included in this bid item are concrete pipe to ductile iron or steel pipe transition pieces required to connect the existing raw water main to the proposed raw water main, complete and in place. The contractor shall be responsible for verifying the laying direction of the existing pipe and ordering the appropriate fitting prior to the time that the interconnection is to be made. The unit price bid for this item shall be full compensation for the furnishing and installing the new concrete to DI or steel pipe adapters, including all labor, materials, and incidentals.

Included in the cost will be stakeout, furnishing of a written cut sheet, dewatering, erosion and sediment control, tree protection, traffic control, excavation, sheeting and/or shoring in accordance with OSHA regulations, pavement removal and proper disposal, clearing, grubbing, grading, care and protection of existing utilities and structures, placement and maintenance of daily temporary pavement patching, thrust protection, backfilling and compaction. Additionally the onsite properly contained temporary storage and drying of trench soils is included. Also included are cleaning, flushing, and testing. In areas where new fittings are placed in soil, a minimum of 4" of clean pliable topsoil (submittal required) and vegetation that matches original vegetation in size and species are included.

Saw cutting of pavement and concrete, the removal, proper disposal and complete joint-to-joint replacement of valley gutter and handicap ramps, in-kind, are also included items. All easement and right of way restoration and related landscaping shall be incorporated in this pay item.

Item 6: Temporary Shoulder Pavement:

Payment shall be based on the **square yard** of temporary shoulder pavement as detailed in the Contract Drawings, complete and in place. The unit price bid for this item shall be full compensation for the furnishing and installing all materials required by the detail on the drawing, and the subsequent removal of temporary pavement, including all labor, materials, and incidentals.

Included in the cost will be, erosion and sediment control, tree protection, traffic control, excavation, pavement placement, maintenance, removal and proper disposal, clearing, grubbing, grading, care and protection of existing utilities and structures. All easement and right of way restoration and related landscaping associated with this work shall be incorporated in this pay item.

Item 7: Select Backfill:

Payment for this item will be based upon the DAILY presentation of delivery tickets to the City's inspector. **Delivery tickets must be given to the City's inspector on a daily basis and will NOT be accepted with monthly invoices.** Select backfill will be measured and paid for by the **CUBIC YARD (CY)** at the established price of \$35.00 per **CUBIC YARD**. This item includes placement and compaction.

The City's inspector shall approve select backfill such as borrow sand or other common granular fill hauled to the job site for use.

A delivery ticket shall accompany each load of select backfill material. Each ticket will be serially numbered, list the company supplying the fill material, truck number of trucks delivering material, date, size of load, and the project where delivered. In the event a material delivery ticket and delivery do not correspond, the City's inspector may refuse the delivery and / or payment until such conditions are corrected to the satisfaction of the City's inspector. Payment shall include the proper removal, replacement and disposal of surplus material.

The Contractor shall designate the source of material and provide appropriate data as part of the submittal process. In the event borrow sand is stored at the project site, it shall be kept at a completely separate location from native soils which are also stored at the construction site.

Item 8: Select Bedding, No. 57 Stone:

Payment for this item, when properly installed as directed by the City's inspector will be based upon the DAILY presentation of delivery tickets to the City's inspector. **Delivery tickets must be given to the City's inspector on a daily**

basis and will NOT be accepted with monthly invoices. Select bedding, No. 57 stone, will be measured and paid for by the **TON** at the established price of \$38.00 per ton.

The Contractor shall designate the source of material and provide appropriate data as part of the submittal process. The City's inspector shall approve select bedding material hauled to the job site for use.

Payment will only be made for additional select bedding, beyond the bedding required by the drawings, used during the installation of pipe work and will not be paid for when in the sole opinion of the City's inspector, proper dewatering methods have not been used. Select bedding required for the installation of manholes and hydrants and where otherwise shown as required on the drawings will not be measured for payment as such, its costs shall be included in the unit prices bid for those items.

A delivery ticket shall accompany each load of select bedding material. Each ticket will be serially numbered, list the company supplying the fill material, truck number of trucks delivering material, date, size of load, and the project where delivered. In the event a material delivery ticket and delivery do not correspond, the City's inspector may refuse the delivery and / or payment until such conditions are corrected to the satisfaction of the City's inspector. Payment shall include the proper removal, replacement and disposal of surplus material.

Item 9: Flowable Fill for Pipe Abandonment:

Payment for this item is based on the **CUBIC YARDS (CY)** of flowable fill used as determined by delivery tickets received at the job site on a daily basis **and** as calculated. This pay item shall include costs, gaining access along the length of the main to facilitate the installation of flowable fill and confirming complete filling for plugging pipe (s), furnishing and placing flowable fill material meeting the requirements of Virginia Department of Transportation (VDOT) Special Provision for Flowable Fill (VDOT S302 G02 – 0610) in pipes to be abandoned in the manner described in the specifications, shown on the Construction Drawings or as directed by the City's inspector. The cost of plugging the pipe to be filled is also included in this item. Included in the price are excavation, backfilling, pavement removal and proper disposal, permanent pavement replacement, valley gutter, handicap ramps, in-kind, area restoration and any other cost not included in any other pay item.

Item 10: Test Pits:

Payment for this item will be based on the number of **EACH (EA)** test pit performed that is made in the specified depth categories. The depth is measured from the lowest authorized point of the excavation to the top of the ground at the point of excavation.

Included in the unit cost of the test pits are all costs of locating buried utilities or structures by non-destructive, open cut methods (for the purpose of obtaining elevations) and where directed by the City's inspector.

Included in the cost will be dewatering, erosion and sediment control, tree protection, traffic control, excavation, sheeting and/or shoring in accordance with OSHA regulations, pavement removal and proper disposal, clearing, grubbing, grading, care and protection of existing utilities and structures, placement and maintenance of daily temporary pavement patching, backfilling and compaction. Additionally the on site properly contained temporary storage and drying of trench soils is included. In areas where test pits are placed in soil, a minimum of 4" of clean pliable topsoil (submittal required) and vegetation that matches original vegetation in size and species are included. Saw cutting of pavement and concrete, the removal, proper disposal and complete joint-to-joint replacement of valley gutter and handicap ramps, in-kind, are also included items. All easement and right of way restoration and related landscaping shall be incorporated in this item.

Any underground utilities, which are uncovered in the normal course of construction, will not be considered as test pits.

Item 11: Curb / Curb and Gutter:

Payment for this item will be based on the number of **LINEAR FEET (LF)** installed.

Included in the unit cost of curb/curb and gutter are all costs of providing and accurate placement of concrete (in compliance with the appropriate City's Public Works specifications), where directed by the City's inspector. **Without exception**, all curb / curb and gutter will be replaced from joint-to-joint. At least one expansion joint will be placed in each section of replacement work.

Also included are stakeout, saw cutting of pavement and concrete, excavation, bedding, form work installation and removal, erosion and sediment control, traffic control, concrete removal and proper disposal, clearing, grubbing, grading, care and protection of existing utilities and structures. All easement and right of way restoration including associated adjacent paving and related landscaping is also included.

Damages to existing curb and gutter that was caused by the contractor and that were not expected to be damaged by the construction work shall be replaced at the contractor's expense.

No payment shall be made for this item until all landscape restoration work is complete to the satisfaction of the City's inspector.

Item 12: Miscellaneous Concrete

Payment for this item will be based on the number of **CUBIC YARDS (CY)** of concrete installed.

Included in the unit cost of concrete are all costs of providing and the accurate placement of concrete (in compliance with Public Works specifications), where directed by the City's inspector. **Without exception**, all sidewalks and slabs will be replaced in-kind from joint-to-joint. At least one expansion joint will be placed in each section of replacement work.

Costs included are stakeout, saw cutting of concrete, excavation, bedding, form work installation and removal, erosion and sediment control, traffic control, concrete removal and proper disposal, clearing, grubbing, grading, care and protection of existing utilities and structures. All easement and right of way restoration and related landscaping are also included.

Damages to existing concrete that was caused by the contractor and that were not expected to be damaged by the construction work shall be replaced at the contractor's expense.

No payment shall be made for this item until all landscape restoration work is complete to the satisfaction of the City's inspector.

Item 13: Undercut and Dispose

Payment for this item will be based on daily totals in **CUBIC YARDS (CY)** agreed to by the Contractor's superintendent and the City's inspector. This item shall only be used after being authorized by the City's inspector. The purpose of this item is to replace unstable areas of the roadway outside of pipe trenches during the road rebuilding process.

Included in the cost will be dewatering, erosion and sediment control, tree protection, traffic control, excavation, sheeting and/or shoring in accordance with OSHA regulations, pavement removal and proper disposal, clearing, grubbing, grading, care and protection of existing utilities and structures, placement and maintenance of temporary pavement patching, backfilling and compaction. Also included are the saw cutting of pavement and concrete, the removal, proper disposal and complete joint-to-joint replacement of: granite and concrete curb, curb and gutter, valley gutter, handicap ramps, sidewalk, driveway and driveway apron in kind are also included items. All right of way restoration, with the exception of permanent pavement replacement, and all related landscaping shall be incorporated in this item.

Item 14: Aggregate Stone Base:

Payment for this item will be based upon the DAILY presentation of delivery tickets to the City's inspector. **Delivery tickets must be given to the City's inspector on a daily basis and will NOT be accepted with monthly invoices.** The costs shall include the furnishing and placement of aggregate base material (VDOT No. 21A), or as directed by the City's inspector, in conformance with lines, grades and thickness shown on the Contract Drawings. Included shall be the cost of sub-grade preparation including excavation, grading and sub-grade compaction as specified. 21A Aggregate will be measured and paid for by the **TON**. The City's inspector shall approve in advance 21A Aggregate hauled to the job site for replacement unstable areas of the roadway outside of pipe trenches during the road rebuilding process.

A delivery ticket shall accompany each load of 21A material. Each ticket will be serially numbered, list the company supplying the fill material, truck number of trucks delivering material, date, size of load, and project where delivered. In the event a material delivery ticket and delivery do not correspond, the City's inspector may refuse the delivery of payment until such conditions are corrected to the satisfaction of the City's inspector.

The Contractor shall designate the source of material and provide appropriate data as part of the submittal process.

Item 15: Asphalt Base Course, BM-25:

Payment for this item shall be for each **TON** that is placed as specified, based upon the DAILY presentation of delivery tickets to the City's inspector. **Delivery tickets must be given to the City's inspector on a daily basis and will NOT be accepted with monthly invoices.** Included in the costs shall be the furnishing and placement of the asphalt base course B-25 material in conformance to lines, grades and thickness shown on the Contract Drawings, as directed by the City's inspector, or as described in the specifications. Tack coat is included in the cost of this item

Item 16: Asphalt Surface Course, SM-9.5:

Payment for this item shall be for each **TON** that is placed as specified, based upon the DAILY presentation of delivery tickets to the City's inspector. **Delivery tickets must be given to the City's inspector on a daily basis and will NOT be accepted with monthly invoices.** Included in the costs shall be the furnishing and placement of the asphalt surface course SM-9.5 material in conformance to lines, grades and thickness shown on the Contract Drawings, as directed by the City's inspector, or as described in the specifications. Tack coat is included in the cost of this item.

Item 17: Corrosion Control System

Payment shall be made as a **LUMP SUM (LS)** for complete installation of the Corrosion Control System according to the Corrosion Control Plan and Detail Sheets and Section 13110. This includes furnishing all material, equipment and labor for installation, testing, test reports, repairs, and the services of a Cathodic Protection Specialist or Corrosion Specialist (NACE certified) required for a complete installation in accordance with the Drawings and Specifications.

Item 18: 8-inch Water Main and Service Connections Adjustments

Payment shall be made as a **LUMP SUM (LS)** for up to 100-feet of 8-inch DI water main relocation to include fittings and two (2) sleeved connections and required adjustments or extensions of existing water service connections. Work to be done in coordination with the Owner and the City of Portsmouth Department of Public Utilities.

Item 19: Air/Vacuum Release Valve and Manhole:

Payment for this item will be based on the number of **EACH** new Air/Vacuum Release Valve and Manhole installed complete and in place.

The unit price bid for this item shall be full compensation for the furnishing and installing of the new Air/Vacuum Release Valve and Manhole complete and in place. Included in the costs will be the furnishing and placement of Utility designation and test pits, installation of the Air/vacuum release assembly, all valves, manhole structure, concrete planks, and associated piping and appurtenances and as shown on the Plans, incidental items per Section 109.1.1 of the Contract Documents, all labor, materials, equipment, tools, and appurtenances required to complete the work.

Included in the cost will be stakeout, furnishing of a written cut sheet, dewatering, erosion and sediment control, tree protection, traffic control, excavation, sheeting and/or shoring in accordance with OSHA regulations, clearing, grubbing, grading, care and protection of existing utilities and structures, backfilling and compaction. Additionally the on-site properly contained temporary storage and drying of trench soils is included. Also included are cleaning, flushing, and testing. In areas where Air/Vacuum Release Valve and Manholes are placed in soil, a minimum of 4" of clean pliable topsoil (submittal required) and vegetation that matches original vegetation in size and species are included. The removal, proper disposal and complete joint-to-joint replacement of: valley gutter, handicap ramps, in-kind, are also included items. With the exception of site restoration specifically included in other pay items, all right of way restoration and related landscaping shall be incorporated in this item.

Item 20: Partially Remove Existing Air Vent Manhole and Piping:

Payment shall be made for **EACH** existing air vent manhole and piping that is demolished down two (2) feet below grade and removed by Contractor. Work includes filling the remaining manhole structure with sand and filling the associated excavation with topsoil. Topsoiling, fine grading, seeding and fertilizing the entire disturbed area are also included.

APPENDIX E

SWPPP for Contractor Use

*36-Inch Raw Water Main Improvements-
Replacement of Western Branch
Elizabeth River Crossing (Line 2)
February 2015
City of Norfolk, Department of Utilities*



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**STORM WATER POLLUTION
PREVENTION PLAN (SWPPP)**
(Pursuant to Virginia Regulation 4VAC 50-60-10 et seq.)

for



**36-Inch Raw Water Main Improvements
Replacement of Western Branch Elizabeth River
Crossing - Line 2**
(located in Chesapeake and Portsmouth, Virginia)

Prepared by:



Michael Baker Jr., Inc.
A Company of Michael Baker International
272 Bendix Road, Suite 400
Virginia Beach, VA 23452

February 2015

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STORM WATER POLLUTION PREVENTION PLAN (SWPPP)
36-Inch Raw Water Main Improvements
Replacement of Western Branch Elizabeth River Crossing - Line 2
 (located in Chesapeake and Portsmouth, Virginia)

TABLE OF CONTENTS

POLICY	3
SWPPP INTRODUCTION.....	4
PROJECT DESCRIPTION.....	4
SITE CHARACTERIZATION.....	5
Existing Site Conditions	5
Off-site Areas.....	5
Soils.....	5
Critical Areas	5
Stormwater Runoff Consideration	5
Estimated Total Area of Disturbance.....	6
INTENDED SEQUENCE OF CONSTRUCTION	6
STORM WATER POLLUTION PREVENTION MEASURES AND CONTROLS.....	6
Erosion Control Measures.....	7
Structural Practices	8
Mud, Debris and Dust Control.....	8
Soil Stabilization.....	8
Effluent from De-watering Activities	8
Solid Waste Disposal	9
Permanent Seeding.....	9
Sanitary Facilities.....	10
Responsible Land Disturber (RLD).....	10
PERMITTED ALLOWABLE DISCHARGES	10
PROJECT DOCUMENTATION REQUIREMENTS.....	10
REQUIRED INSPECTIONS.....	11
MAINTENACE OF SWPPP	11
“BYPASS” AND/OR “UPSET” OF POLLUTANT CONTROL MEASURES.....	13

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)
36-Inch Raw Water Main Improvements
Replacement of Western Branch Elizabeth River Crossing - Line 2
(located in Chesapeake and Portsmouth, Virginia)

TABLE OF CONTENTS (continued)

APPENDICES

- A VSMP General Permit for Discharges of Stormwater from Construction Activities, General Permit No. VAR10
Effective Date: July 1, 2014 | Expiration Date:
- B Construction Activity Operator Permit Fee Form and Registration Statement
- C Contractor Certification Statement
- D Sample Land Disturbance / Site Stabilization Activity Log
- E Sample Pollutant Prevention Measures Inspection Report
- F Notice of Termination
- G Transfer of Ownership Agreement Form

POLICY

It is the policy of the City of Norfolk's Department of Utilities (hereinafter referred to as the "Owner") to secure authority to discharge storm water from land disturbing activities associated with the construction of linear pipe and appurtenances, pump stations, or other facilities (herein after referred to as "Site") when the aggregate area of disturbance within the project limits are equal to one acre or greater [or 2,500 square feet or greater in Chesapeake Bay Preservation Act (hereinafter referred to as "CBPA") Areas].

The Owner will secure appropriate coverage pursuant to these regulations; and, requires full conformance with the storm water regulations of the Virginia Department of Conservation and Recreation (hereinafter referred to as "VDCR") as contained in 4VAC 50-60-10 et seq. of the Virginia Administrative Code.

The Contractor, and all subcontractors, involved with any activity that disturb soils as noted above, or who implement a pollutant control measure identified in the Storm Water Pollution Prevention Plan (herein after referred to as "SW PPP"), must comply with the requirements of:

- 4VAC 50-60-10 et seq. of the Virginia Administrative Code - the Virginia Stormwater Management Program (hereinafter referred to as "VSMP"), as contained in the VDCR VSMP General Permit for Discharges of Stormwater from Construction Activities, General Permit No. VAR10, Effective Date: July 1, 2009, Expiration Date June 30, 2014 [unless revoked by the Virginia Soil and Water Conservation Board prior to the expiration date] (included in Appendix A);
- Title 10.1, Chapter 5, Article 4 et seq. of the Code of Virginia – Virginia Erosion and Sediment Control Law, Regulations and Certification Regulations;
- Chapter 15 et seq. of the City Code - Erosion and Sediment Control; and,
- the latest edition of the Virginia Erosion and Sediment Control Handbook.

The Owner will file a complete Registration Statement for coverage under a VSMP general permit for storm water discharges from construction activities with the VDCR, and receive verification of coverage prior to the commencement of land disturbing activities exceeding the thresholds noted above. All permit application fees will be paid by the Owner, in accordance with the following application threshold:

Construction General / Stormwater Management – Phase II Land Clearing
("Small" Construction Activity – Sites or common plans of development
or sale equal to or greater than one acre and less than five acres)
Permit Issuance Fee: \$450.00

A copy of the Registration Statement (included in Appendix B) for coverage under the general permit for storm water discharges from construction activities as well as a copy of the general permit letter when issued by the VDCR shall be maintained by the Contractor at the construction site.

SWPPP INTRODUCTION

The SWPPP has been prepared for land disturbing activities along the project corridor directly associated with the construction of the 36-Inch Raw Water Main Improvements, Replacement of Western Branch Elizabeth River Crossing - Line 2 project, which is located in the City of Chesapeake, Virginia and the City of Portsmouth, Virginia.

Included in this SWPPP are the elements necessary to comply with the Storm Water General Permit issued by the VDCR under the VSMP. Omissions from this SWPPP do not relieve the Contractor of his responsibility for compliance with the Federal, state and local laws and regulations.

PROJECT DESCRIPTION

Under a separate contract, the City of Norfolk's Department of Utilities performed a Condition Assessment and evaluation of the raw water transmission mains from the Western Branch Pump Station to the 37th Street Water Treatment Plant.

The comprehensive Condition Assessment/Evaluation for the 36" Raw Water Mains (Lines 1 and 2) running from the Western Branch Pump Station to the 37th Street Water Treatment Plant was completed in September of 2004 for the City of Norfolk, Department of Utilities. The purpose of the project was to assess the condition of the raw water mains within the corridor and provide recommendations to improve their reliability and serviceability. Projects were prioritized based on the condition of the pipeline or support, limitations in hydraulic capacity, history of leaks or failures, and potential for future failure. One area addressed in the assessment was the crossing of Line 2 at the Western Branch of the Elizabeth River.

The existing alignment of Line 2 at the Western Branch Crossing crosses under the Elizabeth River from Chesapeake to Portsmouth. It will be replaced with a total of approximately 1,870 linear feet of 36-inch diameter steel pipe (directionally drilled) and approximately 281 linear feet of 36-inch diameter ductile iron pipe (open cut), including erosion and sediment control; traffic control; appurtenances; interconnections; surface restoration; and all other labor, materials, equipment, incidentals and other means of temporary and/or permanent construction necessary or proper for performing and completing the Work as shown in the Contract Documents.

The approximate location of the replacement work is located between 2980 Bruce Road in Chesapeake and 14 Sandie Point Lane in Portsmouth. Pipe to be pulled by directional drill methods will be staged and strung along the south side of Bruce Road from approximately 2980 Bruce Station to a point approximately 1,700 linear feet west of the intersection of Bruce Road and Bruce Station Road.

All areas disturbed during construction will be restored to match pre-construction conditions and elevations following raw water transmission main installations. There are

no permanent impacts associated with this project. No additional impervious area will be generated; and, there will be no changes in volume/velocity of runoff will be caused by this project.

Easements will be obtained from individual property owners, as required. No private property access or encroachments will be permitted without proper authorization.

SITE CHARACTERIZATION

Existing Site Conditions

The west side of the project is located within agricultural and suburban residential land in Chesapeake, Virginia. The east side of the project is located within a condominium development in Portsmouth, Virginia. Adjacent lands to the project include agricultural and residential parcels.

Off-site Areas

This project does not include off-site disturbances. Any off-site activities and/or private Agreements for staging and storage areas are to be negotiated by and between the Contractor and the respective land owner(s).

Soils

The Natural Resources Conservation Service's Web Soil Survey indicates the following soils which may be present with the project limits:

Map Unit Symbol	Map Unit Name
8	Bojac loamy fine sand, 0 to 2 percent slopes
16	Deloss-Tomotley-Nimmo complex, 0 to 1 percent slopes
19	Dragston fine sandy loam, 0 to 2 percent slopes
25	Munden fine sandy loam, 0 to 2 percent slopes
26	Udorthents-Dumps complex
27	Munden-Urban land complex, 0 to 2 percent slopes
30	Nawney silt loam, 0 to 1 percent slopes, frequently flooded

Critical Areas

No critical areas have been identified as having potentially serious erosion problems.

Stormwater Runoff Consideration

The project should have minimal impact on the stormwater runoff. Site will be restored to the existing conditions upon completion of construction.

Estimated Total Area of Disturbance

The estimated disturbance equals 3.8 acres, which includes all areas contained within the limits of silt fence/construction, permanent and temporary construction easements impacted by construction, as well as on-site staging, pipe stringing and storage areas.

Exclusion

All off-site activities and/or private Agreements for staging and storage areas are to be negotiated by and between the Contractor and the respective land owner(s). Such areas are not included as part of the Estimated Total Area of Disturbance shown above, and covered by the issued VSMP General Permit for Discharges of Stormwater from Construction Activities.

THE CONTRACTOR IS REQUIRED TO OBTAIN THE APPROPRIATE COVERAGE FOR ALL DISTURBED AREAS OUTSIDE THE LIMITS OF CONSTRUCTION SHOWN ON THE PLANS, AND IN EXCESS OF 3.8 ACRES.

INTENDED SEQUENCE OF CONSTRUCTION

All construction methods and materials will conform to the project documents and applicable regulatory requirements including Federal, state and local ordinances, codes, amendments, and laws.

Erosion and sediment control measures shall be placed prior to, or as the first step in construction. The Contractor shall be responsible for maintaining these measures throughout the life of the project.

In accordance with the Contract Documents, it shall be Contractor's responsibility to propose a construction schedule to complete all work in the specified contract completion time period, and the Contractor shall be responsible for the sequencing, scheduling and coordinating of the Work, for monitoring the progress of the Work, and for taking appropriate action to keep the Work on schedule. The suggested overall sequence of construction shown on Sheet 2 of the plan set is intended as a guide only.

Upon re-establishment of seeded areas, and when authorized by Owner or its duly appointed representative(s), after final inspection, the Contractor will remove all erosion and sediment controls.

STORM WATER POLLUTION PREVENTION MEASURES AND CONTROLS

A variety of storm water pollution controls or Best Management Practices (herein after referred to as "BMPs") have been included in the construction plans for this project. These controls are reflected in the Erosion and Sediment Controls Notes and Details as shown in the plan set.

Temporary pollution control measures that are shown on Sheet 3 of the construction plans for this project are considered part of this SW PPP, and are to be installed and maintained as a condition of VDCR's VSMP General / Stormwater Management Phase II Land Clearing ("Small" Construction Activity) Permit issued for this project and Virginia Erosion and Sediment Control Law.

Note: There are no permanent BMPs to be constructed as a part of this project.

Vegetated/grassed areas will be permanently stabilized by seeding. Seeding and mulching procedures shall conform to the applicable provisions of the Virginia Erosion and Sediment Control Handbook.

The Contractor shall be responsible for prevention of discharge of solid materials and wastes to the surface waters adjacent to the site. Potential sources of pollution include, but are not limited to, litter, construction debris, on-site vehicle fueling, greases, lubricants, paints, detergents, solvents, chemicals, fertilizers, or other toxic materials. Water used for construction, which discharges from the site, must originate from a public water supply or private well approved by the Virginia Department of Health. Water used for construction that does not originate from an approved public supply must not discharge from the site, and it to be retained in ponds until it infiltrates and/or evaporates.

Erosion Control Measures

All land disturbed by mobilization/construction access to project sites will be restored to their original pre-construction condition. Temporary erosion and sediment control measures will not be removed until all disturbed areas upstream of them are stabilized, as determined with approval by the City of Norfolk's Department of Utilities, or its duly appointed representative(s).

The Contractor shall be required to provide erosion and sediment control measures during all phases of the work. All erosion and sediment control measures shall be in accordance with the Contract Documents. The erosion and sediment controls shown on the plans are the minimum required. Depending on his construction operations, the Contractor may be required to provide additional controls as necessary at the direction of the City of Norfolk's Department of Utilities, or its duly appointed representative(s).

Unless otherwise indicated, all vegetative and structural erosion and sediment control practices shall be constructed and maintained according to minimum Standards and Specifications of the Virginia Erosion and Sediment Control Handbook, latest edition and the requirements set forth under Chapter 15 (Erosion and Sediment Control) of the City Code.

The Contractor is responsible for installation and maintenance of any additional control measures necessary to prevent erosion and sedimentation as determined necessary by the City of Norfolk's Department of Utilities, or its duly appointed representative(s).

Structural Practices

Some controls are intended to function temporarily, and will be used for storm water pollutant control during the construction period. These include:

- Temporary Silt Fencing, denoted as “SF” on the plans
- Stone Construction Entrance (Ingress/Egress), denoted as “CE” on the plans
- Permanent Seeding Schedule
- Erosion and Sediment Control Notes

Mud, Debris and Dust Control

The Contractor shall clean streets of mud and dust and take whatever measures necessary to insure that the streets are kept in a clean and dust free condition at all times.

Dust control shall be provided by the Contractor to a degree that is acceptable to the Owner, and in compliance with applicable local and state dust control regulations. After construction, the site will be stabilized (as described elsewhere), which will reduce the potential for dust generation.

Soil Stabilization

The Contractor shall apply permanent or temporary soil stabilization to all disturbed areas within 7 days after final grade is established on any portion of the site. Soil stabilization must also be applied to disturbed areas, which may not be at final grade, but which will remain undisturbed for longer than 30 days. Soil stabilization measures shall include (but not limited to) vegetative establishment, mulching, and the early application of gravel base material on areas to be paved.

Stock piles of soil and other erodible materials shall be stabilized or protected with sediment trapping measures. The Contractor is responsible for the temporary protection and permanent stabilization for stockpiles onsite as well as for materials transported from the project site.

Effluent from De-watering Activities

Uncontaminated effluent from dewatering operations shall be filtered or passed (or both) through an approved sediment trapping device, and discharged in a manner that does not adversely affect adjacent properties, wetlands, waterways, or the storm drainage system. No contaminated effluent or groundwater may be discharged without a separate Virginia Pollutant Discharge Elimination System (hereinafter referred to as “VPDES”) discharge permit from the Virginia Department of Environmental Quality (hereinafter referred to as “VDEQ”).

Solid Waste Disposal

No solid materials, including building materials, are allowed to be discharged from the site with storm water. All solid waste, including disposable materials incidental to the major construction activities, must be collected, removed from the site and disposed of in a legal manner.

Permanent Seeding

In accordance with the plans, permanent seeding specifications are as follows:

TABLE 3.32-E (Revised June 2003) PERMANENT SEEDING SPECIFICATIONS FOR COASTAL PLAIN AREA										
<u>SEED¹</u>										
LAND USE	SPECIES	APPLICATION RATES								
<u>Minimum Care Lawn (Commercial or Residential)</u>	Tall Fescue ¹ or	175 - 200 lbs.								
	Bermudagrass ¹	75 lbs.								
<u>High-Maintenance Lawn</u>	Tall Fescue ¹ or	200-250 lbs.								
	Bermudagrass ¹ (seed) or	40 lbs. (unhulled) 30 lbs. (hulled)								
	Bermudagrass ¹ (by other vegetative establishment method, see Std. & Spec. 3.34)									
<u>General Slope (3:1 or less)</u>	Tall Fescue ¹	128 lbs.								
	Red Top Grass or Creeping Red Fescue	2 lbs.								
	Seasonal Nurse Crop ²	20 lbs.								
		TOTAL: 150 lbs.								
<u>Low-Maintenance Slope (Steeper than 3:1)</u>	Tall Fescue ¹	93-108 lbs.								
	Bermudagrass ¹	0-15 lbs.								
	Red Top Grass or Creeping Red Fescue	2 lbs.								
	Seasonal Nurse Crop ²	20 lbs.								
	Sericea Lespedeza ³	20 lbs.								
		TOTAL: 150 lbs.								
<p>1 - When selecting varieties of turfgrass, use the Virginia Crop Improvement Association (VCIA) recommended turfgrass variety list. Quality seed will bear a label indicating that they are approved by VCIA. A current turfgrass variety list is available at the local County Extension office or through VCIA at 804-746-4884 or at http://sudan.cses.vt.edu/html/Turf/turf/publications/publications2.html</p> <p>2 - Use seasonal nurse crop in accordance with seeding dates as stated below:</p> <table border="0"> <tr> <td>February, March - April</td> <td>Annual Rye</td> </tr> <tr> <td>May 1st - August</td> <td>Foxtail Millet</td> </tr> <tr> <td>September, October - November 15th</td> <td>Annual Rye</td> </tr> <tr> <td>November 16th - January</td> <td>Winter Rye</td> </tr> </table> <p>3 - May through October, use hulled seed. All other seeding periods, use unhulled seed. If Weeping Lovegrass is used, include in any slope or low maintenance mixture during warmer seeding periods, increase to 30 -40 lbs/acre.</p>			February, March - April	Annual Rye	May 1 st - August	Foxtail Millet	September, October - November 15 th	Annual Rye	November 16 th - January	Winter Rye
February, March - April	Annual Rye									
May 1 st - August	Foxtail Millet									
September, October - November 15 th	Annual Rye									
November 16 th - January	Winter Rye									
<u>FERTILIZER & LIME</u>										
<ul style="list-style-type: none"> ● Apply 10-20-10 fertilizer at a rate of 500 lbs. / acre (or 12 lbs. / 1,000 sq. ft.) ● Apply Pulverized Agricultural Limestone at a rate of 2 tons/acre (or 90 lbs. / 1,000 sq. ft.) <p>NOTE:</p> <ul style="list-style-type: none"> - A soil test is necessary to determine the actual amount of lime required to adjust the soil pH of site. - Incorporate the lime and fertilizer into the top 4 – 6 inches of the soil by disking or by other means. - When applying Slowly Available Nitrogen, use rates available in <u>Erosion & Sediment Control Technical Bulletin # 4, 2003 Nutrient Management for Development Sites</u> at http://www.dcr.state.va.us/sw/e&s.htm#pubs 										

Sanitary Facilities

All personnel involved with construction activities must comply with state and local sanitary or septic system regulations. Temporary sanitary facilities where provided at the site throughout the construction phase must be utilized by all construction personnel and shall be serviced by a commercial operator when provided.

Responsible Land Disturber (RLD)

The Contractor is responsible for providing an individual holding a Responsible Land Disturber Certificate, who will be responsible for compliance with carrying out the land disturbing activity on this project, on behalf of the Owner.

PERMITTED ALLOWABLE DISCHARGES

The VSMP General Permit for Storm Water Discharges from Construction Activities prohibits most non-storm water discharges during the construction phase. Allowable non-storm water discharges covered by the General Permit include:

- a. Discharges from fire fighting activities;
- b. Fire hydrant flushings
- c. Water used to wash vehicles where detergents are not used;
- d. Water used to control dust;
- e. Potable water sources, including uncontaminated waterline flushings;
- f. Routine external building wash down which does not use detergents;
- g. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used;
- h. Uncontaminated air conditioning or compressor condensate;
- i. Uncontaminated ground water or spring water;
- j. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
- k. Uncontaminated excavation dewatering; and,
- l. Landscape irrigation.

PROJECT DOCUMENTATION REQUIREMENTS

The Contractor and all subcontractors involved with land disturbing for this project must sign a copy of the appropriate certification statement (included in Appendix C) which will be incorporated into construction records.

A record of the dates when land disturbing activities occur; when construction activities temporarily or permanently cease on a portion of the site; and, when stabilization

measures are initiated shall be maintained by the Contractor. A sample log for keeping such records is included in Appendix D.

A record of all inspections and corrective actions taken for observed deficiencies shall be maintained by the Contractor. A sample log for keeping such records is included in Appendix E.

This aforementioned information shall be retained as a part of project documentation for at least three (3) years following submission of the Notice of Termination (hereinafter referred to as "NOT") form is included in Appendix F.

Other documentation as required by the VSMP General Permit for Discharges of Stormwater from Construction Activities, General Permit No. VAR10.

REQUIRED INSPECTIONS

Inspections shall be conducted either: 1) at least every seven (7) calendar days; or 2) at least once every 14 calendar days and within 48 hours following any runoff producing storm event. Where areas have been temporarily stabilized or runoff is unlikely due to winter conditions (e.g., the site is covered with snow or ice, or frozen ground exists) such inspections shall be conducted at least once every month.

Inspection documentation shall be in accordance with VSMP General Permit for Discharges of Stormwater from Construction Activities, General Permit No. VAR10, Section II.D.4.

MAINTENANCE OF SWPPP

The techniques described in this SWPPP focus on providing control of pollutant discharges with practical approaches that utilize readily available expertise, materials, and equipment.

A complete copy of the SWPPP, including copies of all inspection reports, plan revisions, etc., must be retained by the Contractor at the project site at all times during working hours. Upon completion of the project, the Owner will file the "NOT". The SWPPP shall be kept in the Owner's permanent project records for at least three (3) years following submission of the "NOT" form. Authorization to discharge terminates at midnight on the date that the Notice of Termination is submitted.

For linear projects, a sign or other notice must be posted at a publicly accessible location near an active part of the construction project (for example, a construction trailer or where the linear project crosses a road). The information contained on the sign must provide:

- i. a copy of the permit coverage letter that includes the registration number for the construction activity; and,

- ii. the internet address at which a copy of the SWPPP may be found or the location of a hard copy of the SWPPP and name and telephone number of a contact person for scheduling viewing times.

The Contractor must provide names and addresses of all subcontractors working on this project who will be involved with all construction activities that disturb site soil. This information must be kept with this SWPPP.

The Contractor and all subcontractors involved with land disturbing for this project must maintain updated project documentation (refer to Appendices C, D and E), which will be incorporated into construction records, and retained for at least three (3) years following submission of the "NOT" form.

As described below, the Contractor shall conduct regular inspections to determine effectiveness of the SWPPP. The SWPPP shall be modified by the Contractor as needed to prevent pollutants from discharging from the site. The Contractor's inspector must be both a person familiar with the site and the nature of the major construction activities and be qualified to evaluate both overall system performance and individual component performance. Additionally, the Contractor's inspector must either be someone empowered to implement modifications to this SWPPP and the pollutant control devices, if needed, or in order to increase effectiveness to an acceptable level.

This SWPPP shall be updated each time there are modifications to the pollutant prevention system or a change of Contractor's working on the project that disturbs site soil. The Contractor shall notify the Owner before these modifications are implemented, unless immediate Contractor action is necessary to prevent unauthorized discharges. If immediate Contractor action is needed, then the Contractor shall notify the Owner of the action as soon as possible.

This SWPPP must be amended as necessary during the course of construction in order to keep it current with the pollutant control measures utilized at the site. Amending the SWPPP does not imply a formalized update and re-print. It is acceptable to add addenda, sketches, handwritten notes, new sections, revised drawings, and/or other pertinent records or documentation as applicable.

Discharge of oil or other hazardous substances into the storm water is subject to reporting and cleanup requirements. Refer to Part III.G of the VSMP General Permit for additional information.

If a section or phase of the project reaches final stabilization prior to the entire project reaching final stabilization, then that section may be clearly marked on the site plans and the date of final stabilization recorded in the SWPPP. Areas so marked are no longer required to be inspected as a part of permit compliance.

This SWPPP is intended to control water-borne and liquid pollutant discharges by some combination of interception, filtration, and/or containment. The Contractor and all subcontractors implementing this SWPPP shall remain aware of the need to periodically refine and update the SWPPP in order to accomplish the intended goals.

This SWPPP shall be amended as necessary during the course of construction in order to keep it current with the pollutant control measures utilized at the site. Amendments to the SWPPP may include, but are not limited to: handwritten revisions; added, deleted or modified sections as applicable; contract Change Orders; sketches and/or revised drawings.

Full compliance with the SWPPP and implementing regulations as contained in 4VAC 50-60-10 et seq. of the Virginia Administrative Code is required in order to fulfill the Contract requirements and shall be considered incidental to the total contract value.

“BYPASS” AND/OR “UPSET” OF POLLUTANT CONTROL MEASURES

As defined under 4VAC 50-60-10 of the Virginia Administrative Code:

“Bypass” means the intentional diversion of waste streams from any portion of a treatment facility.

“Upset” means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the operator. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

It is the responsibility of the Contractor to ensure the adequacy of site storm water pollutant discharge controls. Physical site conditions, weather conditions or Contractor practices may make it necessary to install more structural controls than are shown on the plans. (For example, localized concentrations of runoff could make it necessary to install additional sediment barriers.)

Assessing the need for additional controls and implementing them or adjusting existing controls are key aspects of the effectiveness of this SWPPP until the site achieves final stabilization. The Owner shall be notified by the Contractor should a control fail, be bypassed or otherwise be ineffective in maintaining sediments onsite and releasing sediment offsite. The Owner will provide notification to VDEQ in accordance with Part III.G of the VSMP Storm Water General Permit, as required.

If it is determined by the Owner's Inspector that there has been an upset or bypass of the control measures resulting in a release of sediment to State waters, the Owner's Inspector shall report the bypass or upset to the Department of Environmental Quality within 24 hours of discovery of the unanticipated bypass or upset.

END STORM WATER POLLUTION PREVENTION PLAN

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Appendix A

VSMP General Permit for Discharges of Stormwater from Construction Activities, General Permit No. VAR10

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COMMONWEALTH of VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY

General Permit No.: VAR10

Effective Date: July 1, 2014

Expiration Date: June 30, 2019

**GENERAL VPDES PERMIT FOR DISCHARGES OF STORMWATER FROM CONSTRUCTION
ACTIVITIES**

**AUTHORIZATION TO DISCHARGE UNDER THE VIRGINIA STORMWATER MANAGEMENT
PROGRAM AND THE VIRGINIA STORMWATER MANAGEMENT ACT**

In compliance with the provisions of the Clean Water Act, as amended, and pursuant to the Virginia Stormwater Management Act and regulations adopted pursuant thereto, operators of construction activities are authorized to discharge to surface waters within the boundaries of the Commonwealth of Virginia, except those specifically named in State Water Control Board regulations that prohibit such discharges.

The authorized discharge shall be in accordance with this cover page, Part I - Discharge Authorization and Special Conditions, Part II - Stormwater Pollution Prevention Plan, and Part III - Conditions Applicable to All VPDES Permits as set forth herein.

PART I

DISCHARGE AUTHORIZATION AND SPECIAL CONDITIONS

A. Coverage under this general permit.

1. During the period beginning with the date of coverage under this general permit and lasting until the general permit's expiration date, the operator is authorized to discharge stormwater from construction activities.
2. This general permit also authorizes stormwater discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) located on-site or off-site provided that:
 - a. The support activity is directly related to the construction activity that is required to have general permit coverage for discharges of stormwater from construction activities;
 - b. The support activity is not a commercial operation, nor does it serve multiple unrelated construction activities by different operators;
 - c. The support activity does not operate beyond the completion of the last construction activity it supports;
 - d. The support activity is identified in the registration statement at the time of general permit coverage;
 - e. Appropriate control measures are identified in a stormwater pollution prevention plan and implemented to address the discharges from the support activity areas; and
 - f. All applicable state, federal, and local approvals are obtained for the support activity.

B. Limitations on coverage.

1. Post-construction discharges. This general permit does not authorize stormwater discharges that originate from the site after construction activities have been completed and the site, including any support activity sites covered under the general permit registration, has undergone final stabilization. Post-construction industrial stormwater discharges may need to be covered by a separate VPDES permit.
2. Discharges mixed with nonstormwater. This general permit does not authorize discharges that are mixed with sources of nonstormwater, other than those discharges that are identified in Part I E (Authorized nonstormwater discharges) and are in compliance with this general permit.
3. Discharges covered by another state permit. This general permit does not authorize discharges of stormwater from construction activities that have been covered under an individual permit or required to obtain coverage under an alternative general permit.
4. Impaired waters and TMDL limitation. Discharges of stormwater from construction activities to surface waters identified as impaired in the 2012 § 305(b)/303(d) Water Quality Assessment Integrated Report or for which a TMDL wasteload allocation has been established and approved prior to the term of this general permit for (i) sediment or a sediment-related parameter (i.e., total suspended solids or turbidity) or (ii) nutrients (i.e., nitrogen or phosphorus) are not eligible for coverage under this general permit unless the operator develops, implements, and maintains a SWPPP that minimizes the pollutants of concern and, when applicable, is consistent with the assumptions and requirements of the approved TMDL wasteload allocations. In addition, the operator shall implement the following items:

- a. The impaired water(s), approved TMDL(s), and pollutant(s) of concern, when applicable, shall be identified in the SWPPP;
 - b. Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site;
 - c. Nutrients shall be applied in accordance with manufacturer's recommendations or an approved nutrient management plan and shall not be applied during rainfall events; and
 - d. The applicable SWPPP inspection requirements specified in Part II F 2 shall be amended as follows:
 - (1) Inspections shall be conducted at a frequency of (i) at least once every four business days or (ii) at least once every five business days and no later than 48 hours following a measurable storm event. In the event that a measurable storm event occurs when there are more than 48 hours between business days, the inspection shall be conducted on the next business day; and
 - (2) Representative inspections used by utility line installation, pipeline construction, or other similar linear construction activities shall inspect all outfalls discharging to surface waters identified as impaired or for which a TMDL wasteload allocation has been established and approved prior to the term of this general permit.
5. Exceptional waters limitation. Discharges of stormwater from construction activities not previously covered under the general permit issued in 2009 to exceptional waters identified in 9VAC25-260-30 A 3 c are not eligible for coverage under this general permit unless the operator implements the following:
- a. The exceptional water(s) shall be identified in the SWPPP;
 - b. Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site;
 - c. Nutrients shall be applied in accordance with manufacturer's recommendations or an approved nutrient management plan and shall not be applied during rainfall events; and
 - d. The applicable SWPPP inspection requirements specified in Part II F 2 shall be amended as follows:
 - (1) Inspections shall be conducted at a frequency of (i) at least once every four business days or (ii) at least once every five business days and no later than 48 hours following a measurable storm event. In the event that a measurable storm event occurs when there are more than 48 hours between business days, the inspection shall be conducted on the next business day; and
 - (2) Representative inspections used by utility line installation, pipeline construction, or other similar linear construction activities shall inspect all outfalls discharging to exceptional waters.
6. There shall be no discharge of floating solids or visible foam in other than trace amounts.
- C. Commingled discharges. Discharges authorized by this general permit may be commingled with other sources of stormwater that are not required to be covered under a state permit, so long as the commingled discharge is in compliance with this general permit. Discharges authorized by a separate state or VPDES permit may be commingled with discharges authorized by this general permit so long as all such discharges comply with all applicable state and VPDES permit requirements.

D. Prohibition of nonstormwater discharges. Except as provided in Parts I A 2, I C, and I E, all discharges covered by this general permit shall be composed entirely of stormwater associated with construction activities. All other discharges including the following are prohibited:

1. Wastewater from washout of concrete;
2. Wastewater from the washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;
3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
4. Oils, toxic substances, or hazardous substances from spills or other releases; and
5. Soaps, solvents, or detergents used in equipment and vehicle washing.

E. Authorized nonstormwater discharges. The following nonstormwater discharges from construction activities are authorized by this general permit when discharged in compliance with this general permit:

1. Discharges from firefighting activities;
2. Fire hydrant flushings;
3. Waters used to wash vehicles or equipment where soaps, solvents, or detergents have not been used and the wash water has been filtered, settled, or similarly treated prior to discharge;
4. Water used to control dust that has been filtered, settled, or similarly treated prior to discharge;
5. Potable water sources, including uncontaminated waterline flushings;
6. Routine external building wash down where soaps, solvents or detergents have not been used and the wash water has been filtered, settled, or similarly treated prior to discharge;
7. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (or where all spilled or leaked material has been removed prior to washing); where soaps, solvents, or detergents have not been used; and where the wash water has been filtered, settled, or similarly treated prior to discharge;
8. Uncontaminated air conditioning or compressor condensate;
9. Uncontaminated ground water or spring water;
10. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
11. Uncontaminated excavation dewatering, including dewatering of trenches and excavations that have been filtered, settled, or similarly treated prior to discharge; and
12. Landscape irrigation.

F. Termination of general permit coverage.

1. The operator of the construction activity shall submit a notice of termination in accordance with 9VAC25-880-60 to the VSMP authority after one or more of the following conditions have been met:

- a. Necessary permanent control measures included in the SWPPP for the site are in place and functioning effectively and final stabilization has been achieved on all portions of the site for which the operator is responsible. When applicable, long term responsibility and maintenance requirements shall be recorded in the local land records prior to the submission of a notice of termination;
 - b. Another operator has assumed control over all areas of the site that have not been finally stabilized and obtained coverage for the ongoing discharge;
 - c. Coverage under an alternative VPDES or state permit has been obtained; or
 - d. For residential construction only, temporary soil stabilization has been completed and the residence has been transferred to the homeowner.
2. The notice of termination should be submitted no later than 30 days after one of the above conditions in subdivision 1 of this subsection is met. Authorization to discharge terminates at midnight on the date that the notice of termination is submitted for the conditions set forth in subdivisions 1 b through 1 d of this subsection. Termination of authorizations to discharge for the conditions set forth in subdivision 1 a of this subsection shall be effective upon notification from the department that the provisions of subdivision 1 a of this subsection have been met or 60 days after submittal of the notice of termination, whichever occurs first.
3. The notice of termination shall be signed in accordance with Part III K of this general permit.

G. Water quality protection.

1. The operator must select, install, implement and maintain control measures as identified in the SWPPP at the construction site that minimize pollutants in the discharge as necessary to ensure that the operator's discharge does not cause or contribute to an excursion above any applicable water quality standard.
2. If it is determined by the department that the operator's discharges are causing, have reasonable potential to cause, or are contributing to an excursion above any applicable water quality standard, the department, in consultation with the VSMP authority, may take appropriate enforcement action and require the operator to:
 - a. Modify or implement additional control measures in accordance with Part II B to adequately address the identified water quality concerns;
 - b. Submit valid and verifiable data and information that are representative of ambient conditions and indicate that the receiving water is attaining water quality standards; or
 - c. Submit an individual permit application in accordance with 9VAC25-870-410 B 3.

All written responses required under this chapter must include a signed certification consistent with Part III K.

PART II

STORMWATER POLLUTION PREVENTION PLAN

A stormwater pollution prevention plan (SWPPP) shall be developed prior to the submission of a registration statement and implemented for the construction activity, including any support activity, covered by this general permit. SWPPPs shall be prepared in accordance with good engineering practices. Construction activities that are part of a larger common plan of development or sale and disturb less than one acre may utilize a SWPPP template provided by the department and need not provide a separate stormwater management plan if one has been prepared and implemented for the larger common plan of development or sale.

The SWPPP requirements of this general permit may be fulfilled by incorporating by reference other plans such as a spill prevention control and countermeasure (SPCC) plan developed for the site under § 311 of the federal Clean Water Act or best management practices (BMP) programs otherwise required for the facility provided that the incorporated plan meets or exceeds the SWPPP requirements of Part II A. All plans incorporated by reference into the SWPPP become enforceable under this general permit. If a plan incorporated by reference does not contain all of the required elements of the SWPPP, the operator must develop the missing elements and include them in the SWPPP.

Any operator that was authorized to discharge under the general permit issued in 2009, and that intends to continue coverage under this general permit, shall update its stormwater pollution prevention plan to comply with the requirements of this general permit no later than 60 days after the date of coverage under this general permit.

A. Stormwater pollution prevention plan contents. The SWPPP shall include the following items:

1. General information.

- a. A signed copy of the registration statement, if required, for coverage under the general VPDES permit for discharges of stormwater from construction activities;
- b. Upon receipt, a copy of the notice of coverage under the general VPDES permit for discharges of stormwater from construction activities (i.e., notice of coverage letter);
- c. Upon receipt, a copy of the general VPDES permit for discharges of stormwater from construction activities;
- d. A narrative description of the nature of the construction activity, including the function of the project (e.g., low density residential, shopping mall, highway, etc.);
- e. A legible site plan identifying:
 - (1) Directions of stormwater flow and approximate slopes anticipated after major grading activities;
 - (2) Limits of land disturbance including steep slopes and natural buffers around surface waters that will not be disturbed;
 - (3) Locations of major structural and nonstructural control measures, including sediment basins and traps, perimeter dikes, sediment barriers, and other measures intended to filter, settle, or similarly treat sediment, that will be installed between disturbed areas and the undisturbed vegetated areas in order to increase sediment removal and maximize stormwater infiltration;
 - (4) Locations of surface waters;

- (5) Locations where concentrated stormwater is discharged;
- (6) Locations of support activities, when applicable and when required by the VSMP authority, including but not limited to (i) areas where equipment and vehicle washing, wheel wash water, and other wash water is to occur; (ii) storage areas for chemicals such as acids, fuels, fertilizers, and other lawn care chemicals; (iii) concrete wash out areas; (iv) vehicle fueling and maintenance areas; (v) sanitary waste facilities, including those temporarily placed on the construction site; and (vi) construction waste storage; and
- (7) When applicable, the location of the on-site rain gauge or the methodology established in consultation with the VSMP authority used to identify measurable storm events for inspection purposes.

2. Erosion and sediment control plan.

- a. An erosion and sediment control plan approved by the VESCP authority as authorized under the Erosion and Sediment Control Regulations (9VAC25-840), an "agreement in lieu of a plan" as defined in 9VAC25-840-10 from the VESCP authority, or an erosion and sediment control plan prepared in accordance with annual standards and specifications approved by the department. Any operator proposing a new stormwater discharge from construction activities that is not required to obtain erosion and sediment control plan approval from a VESCP authority or does not adopt department-approved annual standards and specifications shall submit the erosion and sediment control plan to the department for review and approval.
- b. All erosion and sediment control plans shall include a statement describing the maintenance responsibilities required for the erosion and sediment controls used.
- c. A properly implemented approved erosion and sediment control plan, "agreement in lieu of a plan," or erosion and sediment control plan prepared in accordance with department-approved annual standards and specifications, adequately:
 - (1) Controls the volume and velocity of stormwater runoff within the site to minimize soil erosion;
 - (2) Controls stormwater discharges, including peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion;
 - (3) Minimizes the amount of soil exposed during the construction activity;
 - (4) Minimizes the disturbance of steep slopes;
 - (5) Minimizes sediment discharges from the site in a manner that addresses (i) the amount, frequency, intensity, and duration of precipitation; (ii) the nature of resulting stormwater runoff; and (iii) soil characteristics, including the range of soil particle sizes present on the site;
 - (6) Provides and maintains natural buffers around surface waters, directs stormwater to vegetated areas to increase sediment removal, and maximizes stormwater infiltration, unless infeasible;
 - (7) Minimizes soil compaction and, unless infeasible, preserves topsoil;
 - (8) Ensures that stabilization of disturbed areas will be initiated immediately whenever any clearing, grading, excavating, or other land-disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 days; and

- (9) Utilizes outlet structures that withdraw stormwater from the surface (i.e., above the permanent pool or wet storage water surface elevation), unless infeasible, when discharging from sediment basins or sediment traps.

3. Stormwater management plan.

- a. New construction activities. A stormwater management plan approved by the VSMP authority as authorized under the Virginia Stormwater Management Program (VSMP) Regulation (9VAC25-870), or an "agreement in lieu of a stormwater management plan" as defined in 9VAC25-870-10 from the VSMP authority, or a stormwater management plan prepared in accordance with annual standards and specifications approved by the department. Any operator proposing a new stormwater discharge from construction activities that is not required to obtain stormwater management plan approval from a VSMP authority or does not adopt department-approved annual standards and specifications shall submit the stormwater management plan to the department for review and approval.
- b. Existing construction activities. Any operator that was authorized to discharge under the general permit issued in 2009, and that intends to continue coverage under this general permit, shall ensure compliance with the requirements of 9VAC25-870-93 through 9VAC25-870-99 of the VSMP Regulation, including but not limited to the water quality and quantity requirements. The SWPPP shall include a description of, and all necessary calculations supporting, all post-construction stormwater management measures that will be installed prior to the completion of the construction process to control pollutants in stormwater discharges after construction operations have been completed. Structural measures should be placed on upland soils to the degree possible. Such measures must be designed and installed in accordance with applicable VESCP authority, VSMP authority, state, and federal requirements, and any necessary permits must be obtained.

4. Pollution prevention plan. A pollution prevention plan that addresses potential pollutant-generating activities that may reasonably be expected to affect the quality of stormwater discharges from the construction activity, including any support activity. The pollution prevention plan shall:

- a. Identify the potential pollutant-generating activities and the pollutant that is expected to be exposed to stormwater;
- b. Describe the location where the potential pollutant-generating activities will occur, or if identified on the site plan, reference the site plan;
- c. Identify all nonstormwater discharges, as authorized in Part I E of this general permit, that are or will be commingled with stormwater discharges from the construction activity, including any applicable support activity;
- d. Identify the person responsible for implementing the pollution prevention practice or practices for each pollutant-generating activity (if other than the person listed as the qualified personnel);
- e. Describe the pollution prevention practices and procedures that will be implemented to:
 - (1) Prevent and respond to leaks, spills, and other releases including (i) procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases; and (ii) procedures for reporting leaks, spills, and other releases in accordance with Part III G;
 - (2) Prevent the discharge of spilled and leaked fuels and chemicals from vehicle fueling and maintenance activities (e.g., providing secondary containment such as spill berms, decks, spill containment pallets, providing cover where appropriate, and having spill kits readily available);

- (3) Prevent the discharge of soaps, solvents, detergents, and wash water from construction materials, including the clean-up of stucco, paint, form release oils, and curing compounds (e.g., providing (i) cover (e.g., plastic sheeting or temporary roofs) to prevent contact with stormwater; (ii) collection and proper disposal in a manner to prevent contact with stormwater; and (iii) a similarly effective means designed to prevent discharge of these pollutants);
 - (4) Minimize the discharge of pollutants from vehicle and equipment washing, wheel wash water, and other types of washing (e.g., locating activities away from surface waters and stormwater inlets or conveyance and directing wash waters to sediment basins or traps, using filtration devices such as filter bags or sand filters, or using similarly effective controls);
 - (5) Direct concrete wash water into a leak-proof container or leak-proof settling basin. The container or basin shall be designed so that no overflows can occur due to inadequate sizing or precipitation. Hardened concrete wastes shall be removed and disposed of in a manner consistent with the handling of other construction wastes. Liquid concrete wastes shall be removed and disposed of in a manner consistent with the handling of other construction wash waters and shall not be discharged to surface waters;
 - (6) Minimize the discharge of pollutants from storage, handling, and disposal of construction products, materials, and wastes including (i) building products such as asphalt sealants, copper flashing, roofing materials, adhesives, and concrete admixtures; (ii) pesticides, herbicides, insecticides, fertilizers, and landscape materials; and (iii) construction and domestic wastes such as packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, Styrofoam, concrete, and other trash or building materials;
 - (7) Prevent the discharge of fuels, oils, and other petroleum products, hazardous or toxic wastes, and sanitary wastes; and
 - (8) Address any other discharge from the potential pollutant-generating activities not addressed above; and
- f. Describe procedures for providing pollution prevention awareness of all applicable wastes, including any wash water, disposal practices, and applicable disposal locations of such wastes, to personnel in order to comply with the conditions of this general permit. The operator shall implement the procedures described in the SWPPP.
5. SWPPP requirements for discharges to impaired waters, surface waters with an applicable TMDL wasteload allocation established and approved prior to the term of this general permit, and exceptional waters. The SWPPP shall:
- a. Identify the impaired water(s), approved TMDL(s), pollutant(s) of concern, and exceptional waters identified in 9VAC25-260-30 A 3 c, when applicable;
 - b. Provide clear direction that:
 - (1) Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site;
 - (2) Nutrients shall be applied in accordance with manufacturer's recommendations or an approved nutrient management plan and shall not be applied during rainfall events; and
 - (3) A modified inspection schedule shall be implemented in accordance with Part I B 4 or Part I B 5.

6. Qualified personnel. The name, phone number, and qualifications of the qualified personnel conducting inspections required by this general permit.
7. Delegation of authority. The individuals or positions with delegated authority, in accordance with Part III K, to sign inspection reports or modify the SWPPP.
8. SWPPP signature. The SWPPP shall be signed and dated in accordance with Part III K.

B. SWPPP amendments, modification, and updates.

1. The operator shall amend the SWPPP whenever there is a change in the design, construction, operation, or maintenance that has a significant effect on the discharge of pollutants to surface waters and that has not been previously addressed in the SWPPP.
2. The SWPPP must be amended if, during inspections or investigations by the operator's qualified personnel, or by local, state, or federal officials, it is determined that the existing control measures are ineffective in minimizing pollutants in discharges from the construction activity. Revisions to the SWPPP shall include additional or modified control measures designed and implemented to correct problems identified. If approval by the VESCP authority, VSMP authority, or department is necessary for the control measure, revisions to the SWPPP shall be completed no later than seven calendar days following approval. Implementation of these additional or modified control measures must be accomplished as described in Part II G.
3. The SWPPP must clearly identify the contractor(s) that will implement and maintain each control measure identified in the SWPPP. The SWPPP shall be amended to identify any new contractor that will implement and maintain a control measure.
4. The operator shall update the SWPPP no later than seven days following any modification to its implementation. All modifications or updates to the SWPPP shall be noted and shall include the following items:
 - a. A record of dates when:
 - (1) Major grading activities occur;
 - (2) Construction activities temporarily or permanently cease on a portion of the site; and
 - (3) Stabilization measures are initiated;
 - b. Documentation of replaced or modified controls where periodic inspections or other information have indicated that the controls have been used inappropriately or incorrectly and where modified as soon as possible;
 - c. Areas that have reached final stabilization and where no further SWPPP or inspection requirements apply;
 - d. All properties that are no longer under the legal control of the operator and the dates on which the operator no longer had legal control over each property;
 - e. The date of any prohibited discharges, the discharge volume released, and what actions were taken to minimize the impact of the release;
 - f. Measures taken to prevent the reoccurrence of any prohibited discharge; and
 - g. Measures taken to address any evidence identified as a result of an inspection required under Part II F.

5. Amendments, modifications, or updates to the SWPPP shall be signed in accordance with Part III K.

C. Public Notification. Upon commencement of land disturbance, the operator shall post conspicuously a copy of the notice of coverage letter near the main entrance of the construction activity. For linear projects, the operator shall post the notice of coverage letter at a publicly accessible location near an active part of the construction project (e.g., where a pipeline crosses a public road). The operator shall maintain the posted information until termination of general permit coverage as specified in Part I F.

D. SWPPP availability.

1. Operators with day-to-day operational control over SWPPP implementation shall have a copy of the SWPPP available at a central location on-site for use by those identified as having responsibilities under the SWPPP whenever they are on the construction site.
2. The operator shall make the SWPPP and all amendments, modifications, and updates available upon request to the department, the VSMP authority, the EPA, the VESCP authority, local government officials, or the operator of a municipal separate storm sewer system receiving discharges from the construction activity. If an on-site location is unavailable to store the SWPPP when no personnel are present, notice of the SWPPP's location must be posted near the main entrance of the construction site.
3. The operator shall make the SWPPP available for public review in an electronic format or in hard copy. Information for public access to the SWPPP shall be posted and maintained in accordance with Part II C. If not provided electronically, public access to the SWPPP may be arranged upon request at a time and at a publicly accessible location convenient to the operator or his designee but shall be no less than once per month and shall be during normal business hours. Information not required to be contained within the SWPPP by this general permit is not required to be released.

E. SWPPP implementation. The operator shall implement the SWPPP and subsequent amendments, modifications, and updates from commencement of land disturbance until termination of general permit coverage as specified in Part I F.

1. All control measures must be properly maintained in effective operating condition in accordance with good engineering practices and, where applicable, manufacturer specifications. If a site inspection required by Part II F identifies a control measure that is not operating effectively, corrective action(s) shall be completed as soon as practicable, but no later than seven days after discovery or a longer period as established by the VSMP authority, to maintain the continued effectiveness of the control measures.
2. If site inspections required by Part II F identify an existing control measure that needs to be modified or if an additional control measure is necessary for any reason, implementation shall be completed prior to the next anticipated measurable storm event. If implementation prior to the next anticipated measurable storm event is impracticable, then alternative control measures shall be implemented as soon as practicable, but no later than seven days after discovery or a longer period as established by the VSMP authority.

F. SWPPP Inspections.

1. Personnel responsible for on-site and off-site inspections. Inspections required by this general permit shall be conducted by the qualified personnel identified by the operator in the SWPPP. The operator is responsible for insuring that the qualified personnel conduct the inspection.
2. Inspection schedule.
 - a. Inspections shall be conducted at a frequency of:

- (1) At least once every five business days; or
 - (2) At least once every 10 business days and no later than 48 hours following a measurable storm event. In the event that a measurable storm event occurs when there are more than 48 hours between business days, the inspection shall be conducted no later than the next business day.
- b. Where areas have been temporarily stabilized or land-disturbing activities will be suspended due to continuous frozen ground conditions and stormwater discharges are unlikely, the inspection frequency may be reduced to once per month. If weather conditions (such as above freezing temperatures or rain or snow events) make discharges likely, the operator shall immediately resume the regular inspection frequency.
- c. Representative inspections may be utilized for utility line installation, pipeline construction, or other similar linear construction activities provided that:
- (1) Temporary or permanent soil stabilization has been installed and vehicle access may compromise the temporary or permanent soil stabilization and potentially cause additional land disturbance increasing the potential for erosion;
 - (2) Inspections occur on the same frequency as other construction activities;
 - (3) Control measures are inspected along the construction site 0.25 miles above and below each access point (i.e., where a roadway, undisturbed right-of-way, or other similar feature intersects the construction activity and access does not compromise temporary or permanent soil stabilization); and
 - (4) Inspection locations are provided in the report required by Part II F.
3. Inspection requirements.
- a. As part of the inspection, the qualified personnel shall:
- (1) Record the date and time of the inspection and when applicable the date and rainfall amount of the last measurable storm event;
 - (2) Record the information and a description of any discharges occurring at the time of the inspection;
 - (3) Record any land-disturbing activities that have occurred outside of the approved erosion and sediment control plan;
 - (4) Inspect the following for installation in accordance with the approved erosion and sediment control plan, identification of any maintenance needs, and evaluation of effectiveness in minimizing sediment discharge, including whether the control has been inappropriately or incorrectly used:
 - (a) All perimeter erosion and sediment controls, such as silt fence;
 - (b) Soil stockpiles, when applicable, and borrow areas for stabilization or sediment trapping measures;
 - (c) Completed earthen structures, such as dams, dikes, ditches, and diversions for stabilization;

- (d) Cut and fill slopes;
 - (e) Sediment basins and traps, sediment barriers, and other measures installed to control sediment discharge from stormwater;
 - (f) Temporary or permanent channel, flume, or other slope drain structures installed to convey concentrated runoff down cut and fill slopes;
 - (g) Storm inlets that have been made operational to ensure that sediment laden stormwater does not enter without first being filtered or similarly treated; and
 - (h) Construction vehicle access routes that intersect or access paved roads for minimizing sediment tracking;
- (5) Inspect areas that have reached final grade or that will remain dormant for more than 14 days for initiation of stabilization activities;
- (6) Inspect areas that have reached final grade or that will remain dormant for more than 14 days for completion of stabilization activities within seven days of reaching grade or stopping work;
- (7) Inspect for evidence that the approved erosion and sediment control plan, "agreement in lieu of a plan," or erosion and sediment control plan prepared in accordance with department-approved annual standards and specifications has not been properly implemented. This includes but is not limited to:
- (a) Concentrated flows of stormwater in conveyances such as rills, rivulets or channels that have not been filtered, settled, or similarly treated prior to discharge, or evidence thereof;
 - (b) Sediment laden or turbid flows of stormwater that have not been filtered or settled to remove sediments prior to discharge;
 - (c) Sediment deposition in areas that drain to unprotected stormwater inlets or catch basins that discharge to surface waters. Inlets and catch basins with failing sediments controls due to improper installation, lack of maintenance, or inadequate design are considered unprotected;
 - (d) Sediment deposition on any property (including public and private streets) outside of the construction activity covered by this general permit;
 - (e) Required stabilization has not been initiated or completed on portions of the site;
 - (f) Sediment basins without adequate wet or dry storage volume or sediment basins that allow the discharge of stormwater from below the surface of the wet storage portion of the basin;
 - (g) Sediment traps without adequate wet or dry storage or sediment traps that allow the discharge of stormwater from below the surface of the wet storage portion of the trap; and
 - (h) Land disturbance outside of the approved area to be disturbed;
- (8) Inspect pollutant generating activities identified in the pollution prevention plan for the proper implementation, maintenance and effectiveness of the procedures and practices;
- (9) Identify any pollutant generating activities not identified in the pollution prevention plan; and

(10) Identify and document the presence of any evidence of the discharge of pollutants prohibited by this general permit.

4. Inspection report. Each inspection report shall include the following items:
 - a. The date and time of the inspection and when applicable, the date and rainfall amount of the last measurable storm event;
 - b. Summarized findings of the inspection;
 - c. The location(s) of prohibited discharges;
 - d. The location(s) of control measures that require maintenance;
 - e. The location(s) of control measures that failed to operate as designed or proved inadequate or inappropriate for a particular location;
 - f. The location(s) where any evidence identified under Part II F 3 a (7) exists;
 - g. The location(s) where any additional control measure is needed that did not exist at the time of inspection;
 - h. A list of corrective actions required (including any changes to the SWPPP that are necessary) as a result of the inspection or to maintain permit compliance;
 - i. Documentation of any corrective actions required from a previous inspection that have not been implemented; and
 - j. The date and signature of the qualified personnel and the operator or its duly authorized representative.

The inspection report and any actions taken in accordance with Part II must be retained by the operator as part of the SWPPP for at least three years from the date that general permit coverage expires or is terminated. The inspection report shall identify any incidents of noncompliance. Where an inspection report does not identify any incidents of noncompliance, the report shall contain a certification that the construction activity is in compliance with the SWPPP and this general permit. The report shall be signed in accordance with Part III K of this general permit.

G. Corrective actions.

1. The operator shall implement the corrective action(s) identified as a result of an inspection as soon as practicable but no later than seven days after discovery or a longer period as approved by the VSMP authority. If approval of a corrective action by a regulatory authority (e.g., VSMP authority, VESCP authority, or the department) is necessary, additional control measures shall be implemented to minimize pollutants in stormwater discharges until such approvals can be obtained.
2. The operator may be required to remove accumulated sediment deposits located outside of the construction activity covered by this general permit as soon as practicable in order to minimize environmental impacts. The operator shall notify the VSMP authority and the department as well as obtain all applicable federal, state, and local authorizations, approvals, and permits prior to the removal of sediments accumulated in surface waters including wetlands.

PART III

CONDITIONS APPLICABLE TO ALL VPDES PERMITS

NOTE: Discharge monitoring is not required for this general permit. If the operator chooses to monitor stormwater discharges or control measures, the operator must comply with the requirements of subsections A, B, and C, as appropriate.

A. Monitoring.

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitoring activity.
2. Monitoring shall be conducted according to procedures approved under 40 CFR Part 136 or alternative methods approved by the U.S. Environmental Protection Agency, unless other procedures have been specified in this general permit. Analyses performed according to test procedures approved under 40 CFR Part 136 shall be performed by an environmental laboratory certified under regulations adopted by the Department of General Services (1VAC30-45 or 1VAC30-46).
3. The operator shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals that will ensure accuracy of measurements.

B. Records.

1. Monitoring records and reports shall include:
 - a. The date, exact place, and time of sampling or measurements;
 - b. The individual(s) who performed the sampling or measurements;
 - c. The date(s) and time(s) analyses were performed;
 - d. The individual(s) who performed the analyses;
 - e. The analytical techniques or methods used; and
 - f. The results of such analyses.
2. The operator shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this general permit, and records of all data used to complete the registration statement for this general permit, for a period of at least three years from the date of the sample, measurement, report or request for coverage. This period of retention shall be extended automatically during the course of any unresolved litigation regarding the regulated activity or regarding control standards applicable to the operator, or as requested by the board.

C. Reporting monitoring results.

1. The operator shall update the SWPPP to include the results of the monitoring as may be performed in accordance with this general permit, unless another reporting schedule is specified elsewhere in this general permit.
2. Monitoring results shall be reported on a discharge monitoring report (DMR); on forms provided, approved or specified by the department; or in any format provided that the date, location, parameter, method, and result of the monitoring activity are included.

3. If the operator monitors any pollutant specifically addressed by this general permit more frequently than required by this general permit using test procedures approved under 40 CFR Part 136 or using other test procedures approved by the U.S. Environmental Protection Agency or using procedures specified in this general permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or reporting form specified by the department.
4. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this general permit.

D. Duty to provide information. The operator shall furnish, within a reasonable time, any information which the board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this general permit or to determine compliance with this general permit. The board, department, EPA, or VSMP authority may require the operator to furnish, upon request, such plans, specifications, and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of surface waters, or such other information as may be necessary to accomplish the purposes of the CWA and the Virginia Stormwater Management Act. The operator shall also furnish to the board, department, EPA, or VSMP authority, upon request, copies of records required to be kept by this general permit.

E. Compliance schedule reports. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this general permit shall be submitted no later than 14 days following each schedule date.

F. Unauthorized stormwater discharges. Pursuant to § 62.1-44.5 of the Code of Virginia, except in compliance with a state permit issued by the department, it shall be unlawful to cause a stormwater discharge from a construction activity.

G. Reports of unauthorized discharges. Any operator who discharges or causes or allows a discharge of sewage, industrial waste, other wastes or any noxious or deleterious substance or a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, 40 CFR Part 302, or § 62.1-44.34:19 of the Code of Virginia that occurs during a 24-hour period into or upon surface waters or who discharges or causes or allows a discharge that may reasonably be expected to enter surface waters, shall notify the Department of Environmental Quality of the discharge immediately upon discovery of the discharge, but in no case later than within 24 hours after said discovery. A written report of the unauthorized discharge shall be submitted to the department and the VSMP authority within five days of discovery of the discharge. The written report shall contain:

1. A description of the nature and location of the discharge;
2. The cause of the discharge;
3. The date on which the discharge occurred;
4. The length of time that the discharge continued;
5. The volume of the discharge;
6. If the discharge is continuing, how long it is expected to continue;
7. If the discharge is continuing, what the expected total volume of the discharge will be; and
8. Any steps planned or taken to reduce, eliminate and prevent a recurrence of the present discharge or any future discharges not authorized by this general permit.

Discharges reportable to the department and the VSMP authority under the immediate reporting requirements of other regulations are exempted from this requirement.

H. Reports of unusual or extraordinary discharges. If any unusual or extraordinary discharge including a "bypass" or "upset," as defined herein, should occur from a facility and the discharge enters or could be expected to enter surface waters, the operator shall promptly notify, in no case later than within 24 hours, the department and the VSMP authority by telephone after the discovery of the discharge. This notification shall provide all available details of the incident, including any adverse effects on aquatic life and the known number of fish killed. The operator shall reduce the report to writing and shall submit it to the department and the VSMP authority within five days of discovery of the discharge in accordance with Part III I 2. Unusual and extraordinary discharges include but are not limited to any discharge resulting from:

1. Unusual spillage of materials resulting directly or indirectly from processing operations;
2. Breakdown of processing or accessory equipment;
3. Failure or taking out of service of some or all of the facilities; and
4. Flooding or other acts of nature.

I. Reports of noncompliance. The operator shall report any noncompliance which may adversely affect surface waters or may endanger public health.

1. An oral report to the department and the VSMP authority shall be provided within 24 hours from the time the operator becomes aware of the circumstances. The following shall be included as information that shall be reported within 24 hours under this subdivision:
 - a. Any unanticipated bypass; and
 - b. Any upset that causes a discharge to surface waters.
2. A written report shall be submitted within five days and shall contain:
 - a. A description of the noncompliance and its cause;
 - b. The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
 - c. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

The department may waive the written report on a case-by-case basis for reports of noncompliance under Part III I if the oral report has been received within 24 hours and no adverse impact on surface waters has been reported.

3. The operator shall report all instances of noncompliance not reported under Part III I 1 or 2 in writing as part of the SWPPP. The reports shall contain the information listed in Part III I 2.

NOTE: The reports required in Part III G, H and I shall be made to the department and the VSMP authority. Reports may be made by telephone, email, or by fax. For reports outside normal working hours, leaving a recorded message shall fulfill the immediate reporting requirement. For emergencies, the Virginia Department of Emergency Management maintains a 24-hour telephone service at 1-800-468-8892.

4. Where the operator becomes aware of a failure to submit any relevant facts, or submittal of incorrect information in any report, including a registration statement, to the department or the VSMP authority, the operator shall promptly submit such facts or correct information.

J. Notice of planned changes.

1. The operator shall give notice to the department and the VSMP authority as soon as possible of any planned physical alterations or additions to the permitted facility or activity. Notice is required only when:
 - a. The operator plans an alteration or addition to any building, structure, facility, or installation that may meet one of the criteria for determining whether a facility is a new source in 9VAC25-870-420;
 - b. The operator plans an alteration or addition that would significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this general permit; or
2. The operator shall give advance notice to the department and VSMP authority of any planned changes in the permitted facility or activity, which may result in noncompliance with state permit requirements.

K. Signatory requirements.

1. Registration statement. All registration statements shall be signed as follows:
 - a. For a corporation: by a responsible corporate officer. For the purpose of this chapter, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation; or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for state permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
 - c. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this chapter, a principal executive officer of a public agency includes: (i) the chief executive officer of the agency or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.
2. Reports, etc. All reports required by this general permit, including SWPPPs, and other information requested by the board or the department shall be signed by a person described in Part III K 1 or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described in Part III K 1;
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the operator. (A duly authorized

representative may thus be either a named individual or any individual occupying a named position); and

- c. The signed and dated written authorization is included in the SWPPP. A copy must be provided to the department and VSMP authority, if requested.
3. Changes to authorization. If an authorization under Part III K 2 is no longer accurate because a different individual or position has responsibility for the overall operation of the construction activity, a new authorization satisfying the requirements of Part III K 2 shall be submitted to the VSMP authority as the administering entity for the board prior to or together with any reports or information to be signed by an authorized representative.
4. Certification. Any person signing a document under Part III K 1 or 2 shall make the following certification:

"I certify under penalty of law that I have read and understand this document and that this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

L. Duty to comply. The operator shall comply with all conditions of this general permit. Any state permit noncompliance constitutes a violation of the Virginia Stormwater Management Act and the Clean Water Act, except that noncompliance with certain provisions of this general permit may constitute a violation of the Virginia Stormwater Management Act but not the Clean Water Act. Permit noncompliance is grounds for enforcement action; for state permit termination, revocation and reissuance, or modification; or denial of a state permit renewal application.

The operator shall comply with effluent standards or prohibitions established under § 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if this general permit has not yet been modified to incorporate the requirement.

M. Duty to reapply. If the operator wishes to continue an activity regulated by this general permit after the expiration date of this general permit, the operator shall submit a new registration statement at least 90 days before the expiration date of the existing general permit, unless permission for a later date has been granted by the board. The board shall not grant permission for registration statements to be submitted later than the expiration date of the existing general permit.

N. Effect of a state permit. This general permit does not convey any property rights in either real or personal property or any exclusive privileges, nor does it authorize any injury to private property or invasion of personal rights, or any infringement of federal, state or local law or regulations.

O. State law. Nothing in this general permit shall be construed to preclude the institution of any legal action under, or relieve the operator from any responsibilities, liabilities, or penalties established pursuant to any other state law or regulation or under authority preserved by § 510 of the Clean Water Act. Except as provided in general permit conditions on "bypassing" (Part III U) and "upset" (Part III V), nothing in this general permit shall be construed to relieve the operator from civil and criminal penalties for noncompliance.

P. Oil and hazardous substance liability. Nothing in this general permit shall be construed to preclude the institution of any legal action or relieve the operator from any responsibilities, liabilities, or penalties to which the operator is or may be subject under §§ 62.1-44.34:14 through 62.1-44.34:23 of the State Water Control Law or § 311 of the Clean Water Act.

Q. Proper operation and maintenance. The operator shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances), which are installed or used by the operator to achieve compliance with the conditions of this general permit. Proper operation and maintenance also includes effective plant performance, adequate funding, adequate staffing, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems, which are installed by the operator only when the operation is necessary to achieve compliance with the conditions of this general permit.

R. Disposal of solids or sludges. Solids, sludges or other pollutants removed in the course of treatment or management of pollutants shall be disposed of in a manner so as to prevent any pollutant from such materials from entering surface waters and in compliance with all applicable state and federal laws and regulations.

S. Duty to mitigate. The operator shall take all steps to minimize or prevent any discharge in violation of this general permit that has a reasonable likelihood of adversely affecting human health or the environment.

T. Need to halt or reduce activity not a defense. It shall not be a defense for an operator in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this general permit.

U. Bypass.

1. "Bypass," as defined in 9VAC25-870-10, means the intentional diversion of waste streams from any portion of a treatment facility. The operator may allow any bypass to occur that does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to ensure efficient operation. These bypasses are not subject to the provisions of Part III U 2 and 3.
2. Notice.
 - a. Anticipated bypass. If the operator knows in advance of the need for a bypass, the operator shall submit prior notice to the department, if possible at least 10 days before the date of the bypass.
 - b. Unanticipated bypass. The operator shall submit notice of an unanticipated bypass as required in Part III I.
3. Prohibition of bypass.
 - a. Except as provided in Part III U 1, bypass is prohibited, and the board or department may take enforcement action against an operator for bypass unless:
 - (1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage. Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production;
 - (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance; and
 - (3) The operator submitted notices as required under Part III U 2.

- b. The department may approve an anticipated bypass, after considering its adverse effects, if the department determines that it will meet the three conditions listed in Part III U 3 a.

V. Upset.

1. An "upset," as defined in 9VAC25-870-10, means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based state permit effluent limitations because of factors beyond the reasonable control of the operator. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
2. An upset constitutes an affirmative defense to an action brought for noncompliance with technology-based state permit effluent limitations if the requirements of Part III V 4 are met. A determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is not a final administrative action subject to judicial review.
3. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.
4. An operator who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that:
 - a. An upset occurred and that the operator can identify the cause(s) of the upset;
 - b. The permitted facility was at the time being properly operated;
 - c. The operator submitted notice of the upset as required in Part III I; and
 - d. The operator complied with any remedial measures required under Part III S.
5. In any enforcement proceeding, the operator seeking to establish the occurrence of an upset has the burden of proof.

W. Inspection and entry. The operator shall allow the department as the board's designee, the VSMP authority, EPA, or an authorized representative of either entity (including an authorized contractor), upon presentation of credentials and other documents as may be required by law to:

1. Enter upon the operator's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this general permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this general permit;
3. Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this general permit; and
4. Sample or monitor at reasonable times, for the purposes of ensuring state permit compliance or as otherwise authorized by the Clean Water Act or the Virginia Stormwater Management Act, any substances or parameters at any location.

For purposes of this section, the time for inspection shall be deemed reasonable during regular business hours, and whenever the facility is discharging. Nothing contained herein shall make an inspection unreasonable during an emergency.

X. State permit actions. State permits may be modified, revoked and reissued, or terminated for cause. The filing of a request by the operator for a state permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any state permit condition.

Y. Transfer of state permits.

1. State permits are not transferable to any person except after notice to the department. Except as provided in Part III Y 2, a state permit may be transferred by the operator to a new operator only if the state permit has been modified or revoked and reissued, or a minor modification made, to identify the new operator and incorporate such other requirements as may be necessary under the Virginia Stormwater Management Act and the Clean Water Act.
2. As an alternative to transfers under Part III Y 1, this state permit may be automatically transferred to a new operator if:
 - a. The current operator notifies the department at least 30 days in advance of the proposed transfer of the title to the facility or property;
 - b. The notice includes a written agreement between the existing and new operators containing a specific date for transfer of state permit responsibility, coverage, and liability between them; and
 - c. The department does not notify the existing operator and the proposed new operator of its intent to modify or revoke and reissue the state permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in Part III Y 2 b.
3. For ongoing construction activity involving a change of operator, the new operator shall accept and maintain the existing SWPPP, or prepare and implement a new SWPPP prior to taking over operations at the site.

Z. Severability. The provisions of this general permit are severable, and if any provision of this general permit or the application of any provision of this state permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this general permit shall not be affected thereby.

Appendix B

Registration Statement for General Permit Coverage [DCR 199-145 and DCR 199-146 forms]

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Registration Statement
General VPDES Permit for Discharges of Stormwater from Construction Activities (VAR10)

(Please Type or Print All Information)

1. **Construction Activity Operator:** *(General permit coverage will be issued to this operator. The Certification in Item #12 must be signed by the appropriate person associated with this operator.)*

Name: _____

Contact: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____ Phone: _____

Email address (if available): _____

Indicate if DEQ may transmit general permit correspondence electronically: Yes No

2. **Existing General Permit Registration Number (for renewals only):** _____

3. **Name and Location of the Construction Activity:**

Name: _____

Address (if available): _____

City: _____ State: _____ Zip: _____

County (if not located within a City): _____

Latitude (decimal degrees): _____ Longitude (decimal degrees): _____

Name and Location of all Off-site Support Activities to be covered under the general permit:

Name: _____

Address (if available): _____

City: _____ State: _____ Zip: _____

County (if not located within a City): _____

Latitude (decimal degrees): _____ Longitude (decimal degrees): _____

4. **Status of the Construction Activity (check only one):** Federal State Public Private

5. **Nature of the Construction Activity (e.g., commercial, industrial, residential, agricultural, oil and gas, etc.):**

6. **Name of the Receiving Water(s) and Hydrologic Unit Code (HUC):**

Name: _____ Name: _____

HUC: _____ HUC: _____

7. **If the discharge is through a Municipal Separate Storm Sewer System (MS4), the name of the MS4 operator:**

8. **Estimated Project Start and Completion Date:**

Start Date (mm/dd/yyyy): _____

Completion Date (mm/dd/yyyy): _____

9. **Total Land Area of Development (to the nearest one-hundredth acre):** _____ **Estimated Area to be Disturbed (to the nearest one-hundredth acre):** _____

NOTE: This represents the acreage contained within the Limits of Construction shown on the plans, and NOT the area of trench excavation.

10. **Is the area to be disturbed part of a larger common plan of development or sale?** Yes No

11. **A stormwater pollution prevention plan (SWPPP) must be prepared in accordance with the requirements of the General VPDES Permit for Discharges of Stormwater from Construction Activities prior to submitting this Registration Statement. By signing this Registration Statement the operator is certifying that the SWPPP has been prepared.**

12. **Certification:** "I certify under penalty of law that I have read and understand this Registration Statement and that this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations."

Printed Name: _____ Title: _____

Signature: _____ Date: _____

(Please sign in INK. This Certification must be signed by the appropriate person associated with the operator identified in Item #1.)

Instructions for Completing the Registration Statement

General VPDES Permit for Discharges of Stormwater from Construction Activities (VAR10)

GENERAL

A. Coverage Under this General Permit.

Any operator applying for coverage under this general permit who is required to submit a Registration Statement (see Section B below) must submit a complete Registration Statement to the Department. The Registration Statement serves as a Notice of Intent for coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities (VAR10).

B. Single-family Detached Residential Structures.

Operators with an existing stormwater discharge or proposing a new stormwater discharge associated with the construction of a single-family detached residential structure are not required to submit a Registration Statement or the Department of Environmental Quality (DEQ) portion of the general permit fee.

Operators of these types of discharges are authorized to discharge under this general permit immediately upon the general permit's effective date of July 1, 2014.

C. To Apply for Permit Coverage.

1. New Construction Activities. Any operator proposing a new stormwater discharge from construction activities shall submit a complete Registration Statement to the Department prior to the commencement of land disturbance, unless exempted by Section B above. Any operator proposing a new stormwater discharge from construction activities in response to a public emergency where the related work requires immediate authorization to avoid imminent endangerment to human health or the environment is immediately authorized to discharge under this general permit and must submit a complete Registration Statement to the Department no later than 30 days after commencing land disturbance; documentation to substantiate the occurrence of the public emergency must accompany the Registration Statement.

2. Existing Construction Activities. Any operator that was authorized to discharge under the general permit issued in 2009, and who intends to continue coverage under this general permit, shall submit a complete Registration Statement to the Department on or before June 1, 2014, unless exempted by Section B above.

D. Where to Submit Registration Statements.

All Registration Statements should be submitted to:

**Department of Environmental Quality
Office of Stormwater Management, 10th Floor
P.O. Box 1105
Richmond, VA 23218**

LINE-BY-LINE INSTRUCTIONS

Item 1: Construction Activity Operator Information.

"Operator" means the owner or operator of any facility or activity subject to the Stormwater Management Act and regulations. In the context of stormwater associated with a large or small construction activity, operator means any person associated with a construction project that meets either of the following two criteria: (i) the person has direct operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications or (ii) the person has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a stormwater pollution prevention plan for the site or other state permit or VSMP authority permit conditions (i.e., they are authorized to direct workers at a site to carry out activities required by the stormwater pollution prevention plan or comply with other permit conditions).

The entities that are considered operators will commonly consist of the owner or developer of a project (the party with control of project plans and specifications) or the general contractor (the party with day to day operational control of the activities at the project site which are necessary to ensure compliance with the general permit).

Provide the legal name (do not use a colloquial name), contact, mailing address, telephone number, and email address (if available) of the construction activity operator; general permit coverage will be issued to this operator. Indicate if the Department may transmit general permit correspondence electronically.

Item 2: Existing General Permit Registration Number.

For reapplications only, provide the existing general permit registration number for the construction activity. This item does not need to be completed for new construction activities applying for general permit coverage.

Item 3: Name and Location of the Construction Activity Information.

Provide the official name, street address (if available), city or county (if not located within a City) of the construction activity. Also, provide the latitude and longitude in decimal degrees of the approximate center of the construction activity (e.g., N 37.5000, W 77.5000).

Name and Location of Off-site Support Activity Information.

This general permit also authorizes stormwater discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) located on-site or off-site provided that (i) the support activity is directly related to a construction activity that is required to have general permit coverage; (ii) the support activity is not a commercial operation, nor does it serve multiple unrelated construction activities by different operators; (iii) the support activity does not operate beyond the completion of the construction activity it supports; (iv) the support activity is identified in the registration statement at the time of general permit coverage; (v) appropriate control measures are identified in a SWPPP and implemented to address the discharges from the support activity areas; and (vi) all applicable state, federal, and local approvals are obtained for the support activity.

Provide the official name, street address (if available), City and County (if not located within a City) of all off-site support activities to be covered under this general permit. Also, provide the latitude and longitude in decimal degrees of the approximate center of the off-site support activities (e.g., N 37.5000, W 77.5000). Also, if an off-site support activity is going to be covered under this general permit the total land area of the off-site support activity and the estimated area to be disturbed by the off-site support activity need to be included in Item #9.

Item 4: Status of the Construction Activity.

Indicate the appropriate status (Federal, State, Public, or Private) of the construction activity.

Item 5: Nature of the Construction Activity.

Provide a brief description of the construction activity, such as commercial, residential, agricultural, oil and gas, etc. This list is not all inclusive.

Item 6: Receiving Waters(s) and HUC Information.

Provide the name of the receiving water(s) and corresponding HUC for all stormwater discharges including any stormwater discharges from off-site support activities to be covered under this general permit. Hydrologic Unit Code or HUC is a watershed unit established in the most recent version of Virginia's 6th order national watershed boundary dataset.

Item 7: MS4 Information.

If stormwater is discharged through a municipal separate storm sewer system (MS4), provide the name of the MS4 operator. The name of the MS4 operator is generally the Town, City, County, Institute or Federal facility where the construction activity is located.

Item 8: Construction Activity Start and Completion Date Information.

Provide the estimated start date (month/day/year) of the construction activity. Provide the estimated completion date (month/day/year) of the construction activity.

Item 9: Construction Activity Area Information.

Provide the total area (to the nearest one-hundredth acre) of the development (i.e., the total acreage of the larger common plan of development or sale). Include the total acreage of any off-site support activity to be covered under this general permit.

Provide the estimated area (to the nearest one-hundredth acre) to be disturbed by the construction activity. Include the estimated area of land disturbance that will occur at any off-site support activity to be covered under this general permit.

Item 10: Common Plan of Development or Sale Information.

Indicate if the area to be disturbed by the construction activity is part of a larger common plan of development or sale. Larger common plan of development or sale is defined as a contiguous area where separate and distinct construction may be taking place at different times on different schedules. Plan is broadly defined as any announcement or documentation, including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, etc., or physical demarcation such as boundary signs, lot stakes, or surveyor markings indicating that construction activities may occur.

Item 11: Stormwater Pollution Prevention Plan (SWPPP).

A Stormwater Pollution Prevention Plan (SWPPP) must be prepared in accordance with the requirements of the General VPDES Permit for Discharges of Stormwater from Construction Activities (VAR10) prior to submitting this Registration Statement. By signing this Registration Statement the operator is certifying that the SWPPP has been prepared.

Item 12: Certification.

A properly authorized individual associated with the operator identified in Item 1 of the Registration Statement is responsible for certifying and signing the Registration Statement. **Please sign the Registration Statement in INK.**

State statutes provide for severe penalties for submitting false information on the Registration Statement. State regulations require that the Registration Statement be signed as follows:

a. For a corporation: by a responsible corporate officer. For the purpose of this part, a responsible corporate officer means:

(i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation, or

(ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been

assigned or delegated to the manager in accordance with corporate procedures.

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.

c. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this part, a principal executive officer of a public agency includes:

(i) The chief executive officer of the agency, or

(ii) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

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Appendix C

Contractor Certification Statement

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ONTRACTOR CERTIFICATION STATEMENT

36-Inch Raw Water Main Improvements Replacement of Western Branch Elizabeth River Crossing - Line 2 (located in Chesapeake and Portsmouth, Virginia)

The Contractor and/or subcontractor(s) that will implement the pollutant control measures described in the SWPPP must be identified below, and must sign a statement certifying that they understand the requirements of the VSMP General Permit for Discharges of Stormwater from Construction Activities, General Permit No. VA R10, which authorizes storm water discharges during construction. These statements are to be maintained as a part of project documentation.

Contractor (or subcontractor) implementing measures contained in the SWPPP:

Company Name

Business Address (including street address, City, State, and Zip Code)

Business Telephone (including Area Code, 10-digit)

Activities which this Contractor (or subcontractor) is responsible for:

CERTIFICATION STATEMENT:

"I certify under penalty of law that I understand the terms and conditions of the VSMP General Permit for Discharges of Stormwater from Construction Activities (VAR10) and the SWPPP that authorizes storm water discharges associated with land disturbing activities from the construction identified as a part of the aforementioned project."

Signature

Date

Printed Name

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Appendix D

Sample Land Disturbance / Site Stabilization Activity Log

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LAND DISTURBANCE / SITE STABILIZATION ACTIVITY LOG

36-Inch Raw Water Main Improvements Replacement of Western Branch Elizabeth River Crossing - Line 2 (located in Chesapeake and Portsmouth, Virginia)

A record of dates when land disturbing activities occur, when construction activities temporarily or permanently cease on a portion of the project, and when stabilization measures are initiated and/or modified shall be maintained by the Contractor as a part of project documentation. If the Contractor elects to use another reporting form, it shall contain the information shown herein at a minimum.

Description of Activity

Location of Activity

Begin Date

End

Date

Contractor Name Performing Work

Description of Activity

Location of Activity

Begin Date

End

Date

Contractor Name Performing Work

Description of Activity

Location of Activity

Begin Date

End

Date

Contractor Name Performing Work

Description of Activity

Location of Activity

Begin Date

End

Date

Contractor Name Performing Work

Description of Activity

Location of Activity

Begin Date

End

Date

Contractor Name Performing Work

Description of Activity

Location of Activity

Begin Date

End

Date

Contractor Name Performing Work

Description of Activity

Location of Activity

Begin Date

End

Date

Contractor Name Performing Work

Appendix E

Sample Pollutant Prevention Measures Inspection Report

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POLLUTANT PREVENTION MEASURES INSPECTION REPORT

36-Inch Raw Water Main Improvements Replacement of Western Branch Elizabeth River Crossing - Line 2 (located in Chesapeake and Portsmouth, Virginia)

Inspection Date/Time	Inspector	Name
----------------------	-----------	------

Inspecting Company Name	Inspector	Title
-------------------------	-----------	-------

Reason for Inspection:	<input type="checkbox"/> Regular Inspection	<input type="checkbox"/> Pre-Rainfall Inspection
	<input type="checkbox"/> Re-Inspection	<input type="checkbox"/> Post-Rainfall Inspection

Has a sediment discharge occurred since the last inspection? Yes No

Are the pollutant control measures in compliance with E&S regulations? Yes No

*Check **only one box** for each item listed below:
(Check "N/A" **only** if the item does not apply to this project)*

Item Description	In Compliance at the Time of Inspection		
SWPPP located on-site (contains all E&S control updates)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Construction Entrances	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Sediment Barriers	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Storage / Disposal Areas	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Sediment Traps	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Check Dams	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Inlet Protection	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Tree Protection	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Silt or Super Silt Fence	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Diversion Dikes	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Stockpile Stabilization	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Temporary Stabilization of Denuded Areas	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Is Temporary Stabilization Adequate	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Permanent Stabilization of Denuded Areas	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

Item Description (continued)	In Compliance at the Time of Inspection		
Is Permanent Stabilization Adequate	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Turbidity Curtains	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Public Roads Free of Dust and Debris	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Removal of Accumulated Sediment	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Discharge Points Free of Sediment Deposits at Receiving Waters	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Site Free of Trash/Litter	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Site Free of Spills, Leaks or Other Harmful Materials	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Dumpsters Secured and Covered	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Natural Resources Protected	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Temporary Fuel Tanks Secured and Contained	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Wash Facilities Maintained	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Sanitary Facilities Maintained	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Dewatering Devices	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Removal of Pollutant Control Measures Which Are No Longer Required	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Repair of Defective, Damaged or Failing Pollutant Control Measures	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
VSMP Permit Letter and SWPPP Location Information Displayed	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Other:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

Are additional sheets attached as a part of this Inspection Report? Yes No
 (Provide additional sheets as required for documentation)

CORRECTIVE ACTIONS TO BE TAKEN: Yes No
 (Explain all Item Descriptions above checked “No”, attach additional sheets as necessary)

CERTIFICATION STATEMENT:

“I certify under penalty of law that I have read and understand t his document, and that the information submitted in this Pollutant Prevention Measures Inspection Report is, to the best of my knowledge and belief, true, accurate, and complete. I am aware t hat there are significant penalties for submitting false information.”

Inspector Signature

Date

Inspector Printed Name

NOTE: Based on the results of the inspection, if any Corrective Actions are required, they shall be completed before the next anticipated rainfall event or within 7 calendar days of the inspection.

Notice of Corrective Actions Provided to:

Name/Title

Date/Ti

me

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Appendix F

Notice of Termination (“NOT”) [DCR 199-147 form]

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Notice of Termination
General VPDES Permit for Discharges of Stormwater from Construction Activities (VAR10)

(Please Type or Print All Information)

1. Construction Activity Operator:

Name: _____

Contact: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____ Phone: _____

Email address (if available): _____

2. Name and Location of the Construction Activity: (As listed on the Registration Statement.)

Name: _____

Address (if available): _____

City: _____ State: _____ Zip: _____

County (if not located within a City): _____

Latitude (decimal degrees): _____ Longitude (decimal degrees): _____

3. General Permit Registration Number: _____

4. Reason for Terminating Coverage Under the General Permit: (The operator shall submit a Notice of Termination after one or more of the following conditions have been met.)

- A. Necessary permanent control measures included in the SWPPP for the site are in place and functioning effectively and final stabilization has been achieved on all portions of the site for which the operator is responsible. When applicable, long-term responsibility and maintenance requirements for permanent control measures shall be recorded in the local land records prior to the submission of a notice of termination;
- B. Another operator has assumed control over all areas of the site that have not been finally stabilized and obtained coverage for the ongoing discharge;
- C. Coverage under an alternative VPDES or state permit has been obtained; or
- D. For residential construction only, temporary soil stabilization has been completed and the residence has been transferred to the homeowner.

The notice of termination should be submitted no later than 30 days after one of the above conditions being met. Authorization to discharge terminates at midnight on the date that the notice of termination is submitted for the conditions set forth in subsections B through D above, unless otherwise notified by the VSMP authority or the Department. Termination of authorizations to discharge for the conditions set forth in subsection A above shall be effective upon notification from the Department that the provisions of subsection A have been met or 60 days after submittal of the notice of terminations, whichever occurs first.

5. Permanent Control Measures Installed: (When applicable, a list of the on-site and off-site permanent control measures (both structural and nonstructural) that were installed to comply with the stormwater management technical criteria. Attach a separate list if additional space is needed.)

Permanent Control Measure #1

Type of Permanent Control Measure: _____

Date Functional: _____

Address (if available): _____

City: _____ State: _____ Zip: _____

County (if not located within a City): _____

Latitude (decimal degrees): _____ Longitude (decimal degrees): _____

Receiving Water: _____

Total Acres Treated: _____ Impervious Acres Treated: _____

Permanent Control Measure #2

Type of Permanent Control Measure: _____

Date Functional: _____

Address (if available): _____

City: _____ State: _____ Zip: _____

County (if not located within a City): _____

Latitude (decimal degrees): _____ Longitude (decimal degrees): _____

Receiving Water: _____

Total Acres Treated: _____ Impervious Acres Treated: _____

Permanent Control Measure #3

Type of Permanent Control Measure: _____

Date Functional: _____

Address (if available): _____

City: _____ State: _____ Zip: _____

County (if not located within a City): _____

Latitude (decimal degrees): _____ Longitude (decimal degrees): _____

Receiving Water: _____

Total Acres Treated: _____ Impervious Acres Treated: _____

6. **Participation in a Regional Stormwater Management Plan:** (When applicable, information related to the participation in a regional stormwater management plan. Attach a separate list if additional space is needed.)

Regional Stormwater Management Facility

Type of Regional Stormwater Management Facility: _____

Address (if available): _____

City: _____ State: _____ Zip: _____

County (if not located within a City): _____

Latitude (decimal degrees): _____ Longitude (decimal degrees): _____

Total Site Acres Treated: _____ Impervious Site Acres Treated: _____

7. **Perpetual Nutrient Credits:** (When applicable, information related to perpetual nutrient credits that were acquired in accordance with § 62.1-44.15:35 of the Code of Virginia. Attach a separate list if additional space is needed.)

Nonpoint Nutrient Credit Generating Entity

Name: _____

Perpetual Nutrient Credits Acquired (lbs/acre/year): _____

8. **Certification:** "I certify under penalty of law that I have read and understand this Notice of Termination and that this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations."

Printed Name: _____ Title: _____

Signature: _____ Date: _____

(Please sign in INK. This Certification must be signed by the appropriate person associated with the operator identified in Item #1.)

Instructions for Completing the Notice of Termination General VDPES Permit for Discharges of Stormwater from Construction Activities (VAR10)

GENERAL

A Notice of Termination must be submitted when an operator no longer wishes to be covered under the General VDPES Permit for Discharges of Stormwater from Construction Activities (VAR10).

All Notice of Terminations should be submitted to:

**Department of Environmental Quality
Office of Stormwater Management, 10th Floor
P.O. Box 1105
Richmond, VA 23218**

LINE-BY-LINE INSTRUCTIONS

Item 1: Construction Activity Operator Information.

Provide the legal name (do not use a colloquial name), contact, mailing address, telephone number, and email address (if available) of the construction activity operator that was issued general permit coverage.

Item 2: Name and Location of the Construction Activity Information.

Provide the official name, street address (if available), city or county (if not located within a City) of the construction activity. Also, provide the latitude and longitude in decimal degrees of the approximate center of the construction activity (e.g., N 37.5000, W 77.5000). NOTE: This information can be obtained from the previously submitted Registration Statement.

Item 3: General Permit Registration Number.

Provide the existing general permit registration number for the construction activity identified in Item 2.

Item 4: Reason for Termination.

Indicate the appropriate reason for submitting this Notice of Termination. The Notice of Termination may only be submitted after one or more of the following conditions have been met:

- a. Necessary permanent control measures included in the SWPPP for the site are in place and functioning effectively and final stabilization has been achieved on all portions of the site for which the operator is responsible. When applicable, long-term responsibility and maintenance requirements for permanent control measures shall be recorded in the local land records prior to the submission of a notice of termination;
- b. Another operator has assumed control over all areas of the site that have not been finally stabilized and obtained coverage for the ongoing discharge;
- c. Coverage under an alternative VDPES or state permit has been obtained; or
- d. For residential construction only, temporary soil stabilization has been completed and the residence has been transferred to the homeowner.

The Notice of Termination should be submitted no later than 30 days after one of the above conditions being met.

Item 5: Permanent Control Measures (when applicable).

For each on-site and off-site permanent control measure (both structural and non-structural) that was installed to comply with the stormwater management technical criteria provide the following information:

- a. The type of permanent control measure;

- b. The date that the permanent control measure became functional as a post-development stormwater management control;
- c. The street address (if available), City or County (if not located within a City) of the permanent control measure;
- d. The latitude and longitude in decimal degrees of the approximate center of the permanent control measure;
- e. The receiving water of the permanent control measure; and
- f. The number of total and impervious acres treated by the permanent control measure (to the nearest one-tenth of an acre).

Attach a separate list if additional space is needed.

Item 6: Participation in a Regional Stormwater Management Plan (when applicable).

For each Regional Stormwater Management Facility provide the following information:

- a. The type of regional facility to which the site contributes;
- b. The street address (if available), City or County (if not located within a City) of the regional facility;
- c. The latitude and longitude in decimal degrees of the approximate center of the regional facility; and
- d. The number of total and impervious site acres treated by the regional facility (to the nearest one-tenth of an acre).

Attach a separate list if additional space is needed.

Item 7: Perpetual Nutrient Credits (when applicable).

Provide the following information related to perpetual nutrient credits that were acquired in accordance with § 62.1-44.15:35 of the Code of Virginia:

- a. The name of the nonpoint nutrient credit generating entity from which perpetual nutrient credits were acquired; and
- b. The number of perpetual nutrient credits acquired (lbs. per acre per year).

Attach a separate list if additional space is needed.

Item 8: Certification.

A properly authorized individual associated with the operator identified in Item 1 of the Registration Statement is responsible for certifying and signing the Registration Statement. **Please sign the Registration Statement in INK.**

State statutes provide for severe penalties for submitting false information on the Registration Statement. State regulations require that the Registration Statement be signed as follows:

- a. For a corporation: by a responsible corporate officer. For the purpose of this part, a responsible corporate officer means:
 - (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation, or
 - (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated

facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.

c. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this part, a principal executive officer of a public agency includes:

(i) The chief executive officer of the agency, or

(ii) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

APPENDIX F

Project Sign Detail

*36-Inch Raw Water Main Improvements-
Replacement of Western Branch
Elizabeth River Crossing (Line 2)
February 2015
City of Norfolk, Department of Utilities*



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APPENDIX G

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APPENDIX H

Soil Borings

**The following soil borings were prepared as part of a geotechnical investigation.
The complete report is available from Michael Baker Jr., Inc. upon request.**

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● - Approximate Boring Location

SUBSURFACE EXPLORATION PLAN

Michael Baker, Jr., Inc.
 Western Branch New 36-Inch RW Main
 Chesapeake and Portsmouth, Virginia

FROEHLING & ROBERTSON, INC.
Engineering Stability Since 1881
 Greenbrier Commerce Park
 833 Professional Place, West
 Chesapeake, Virginia 23320-3601 | USA
 T 757.436.1111 | F 757.436.1674



DATE: April 2012	Drawing No. 2
SCALE: None	
EDITED: ecl	61N-0240



APPENDIX III

Boring Log B-01, B-02, and B-03

Key to Boring Log Soil Classification

Unified Soil Classification System



Project No: 61N-0240

Elevation: ± Ground Surface

Drilling Method: Mud Rotary

Client: Michael Baker, Jr., Inc.

Total Depth: 100.0'

Hammer Type: Automatic

Project: Western Branch New 36-Inch RW Main

Boring Location: See F&R Drawing No. 2

Date Drilled: 4/4/12

City/State: Portsmouth, Virginia

Driller: FDI

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
0.0	0.3	Asphalt - 3 Inches Thick, Degraded	33-22-9	0.3		* Sample Blows obtained with an automatic hammer. Reported Sample Blows have been corrected to equivalent N ₆₀ energy.
0.0	0.5	Crushed Stone - 3 Inches Thick, Fine to Coarse Gravel	-5	2.0	31	
		Medium Dense to Loose, Brown, Clayey Fine SAND, moist (SC)	4-5-5			
			-4	4.0	10	
0.0	4.0	Loose, Tan to Brown, Silty Fine SAND with trace fine gravel and trace clay, moist (SM)	3-3-4	4.0	7	
			-4	6.0	8	
			4-4-4			
			-5	8.0	10	
0.0	8.0	Very Loose to Medium Dense, Brown to Tan, Fine to Medium SAND with trace to little silt, moist (SP-SM)	5-5-5	8.0		
			-7	10.0		
		Same, Wet at 12 Feet				Groundwater was judged to be encountered at a depth of approximately 12 feet during drilling.
			4-1-1	13.0	2	
			-3	15.0		
			3-3-4	18.0	7	
			-4	20.0		
			7-13-13	23.0	26	
			-18	25.0		
			18-14-13	28.0	27	
			-14	30.0		
			8-8-9	33.0	17	
			-9	35.0		
0.0	37.0	Very Stiff, Dark Brown, PEAT, wet (PT)				
			7-8-9	38.0	17	
			-14			

BORING_LOG_61N-0240 (BAKER - WESTERN BRANCH LINE).GPI F&R.GDT 5/10/12

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.



Project No: 61N-0240

Elevation: ± Ground Surface

Drilling Method: Mud Rotary

Client: Michael Baker, Jr., Inc.

Total Depth: 100.0'

Hammer Type: Automatic

Project: Western Branch New 36-Inch RW Main

Boring Location: See F&R Drawing No. 2

Date Drilled: 4/4/12

City/State: Portsmouth, Virginia

Driller: FDI

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
0.0	42.0	Very Stiff, Dark Brown, PEAT, wet (PT)		40.0		* Sample Blows obtained with an automatic hammer. Reported Sample Blows have been corrected to equivalent N ₆₀ energy.
		Medium Dense to Dense, Gray, Silty Fine SAND, wet (SM)	9-9-10 -13	43.0	19	
				45.0		
			7-22-26 -14	48.0	48	
				50.0		
0.0	52.0	Firm to Stiff, Gray, Silty CLAY with trace fine sand and trace marine shell fragments, wet (CL)	3-3-4 -7	53.0	7	
		Same, Contains Thin Fine Sand Lenses Below 57 Feet		55.0		
			3-4-4 -7	58.0	8	
				60.0		
			4-4-5 -8	63.0	9	
				65.0		
			4-5-7 -10	68.0	12	
				70.0		
			5-5-7 -12	73.0	12	
				75.0		
0.0	77.0	Medium Dense, Gray, Silty Fine SAND with little clay, marine shell fragments and trace marine shells, wet (SM)	5-8-13 -23	78.0	21	

BORING_LOG_61N-0240 (BAKER - WESTERN BRANCH LINE).GPI F&R.GDT 5/10/12

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.



Project No: 61N-0240

Elevation: ± Ground Surface

Drilling Method: Mud Rotary

Client: Michael Baker, Jr., Inc.

Total Depth: 100.0'

Hammer Type: Automatic

Project: Western Branch New 36-Inch RW Main

Boring Location: See F&R Drawing No. 2

Date Drilled: 4/4/12

City/State: Portsmouth, Virginia

Driller: FDI

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
		Medium Dense, Gray, Silty Fine SAND with little clay, marine shell fragments and trace marine shells, wet (SM)		80.0	12	* Sample Blows obtained with an automatic hammer. Reported Sample Blows have been corrected to equivalent N ₆₀ energy.
			5-5-7 -10	83.0		
				85.0		
			5-4-8 -14	88.0	12	
				90.0		
			3-4-7 -13	93.0	11	
				95.0		
				98.0	12	
0.0	100.0	Boring Terminated at a Depth of 100 Feet			100.0	

BORING_LOG_61N-0240 (BAKER - WESTERN BRANCH LINE).GPJ F&R.GDT 5/10/12

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.



Project No: 61N-0240

Elevation: Top of Pier

Drilling Method: Mud Rotary

Client: Michael Baker, Jr., Inc.

Total Depth: 125.0'

Hammer Type: Automatic

Project: Western Branch New 36-Inch RW Main

Boring Location: See F&R Drawing No. 2

Date Drilled: 4/4/12

City/State: Portsmouth, Virginia

Driller: FDI

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
0.0	3.0	Air				* Sample Blows obtained with an automatic hammer. Reported Sample Blows have been corrected to equivalent N ₆₀ energy. Depth referenced from top of pier deck.
		Water				
0.0	24.5	Very Soft, Gray, Clayey SILT with trace marine shell fragments, wet (ML)	***_***_***	24.5	0	*** - Weight of Rod
			__1	26.5		** - Weight of Hammer
			-0	28.5		
			__**	31.5		
0.0	33.0	Very Soft, Brown, CLAY, wet (CH)	_**	33.5	0	
			__**	36.5		
			_**	38.5		
			__3	41.5		
0.0	42.5	Very Loose, Gray, Silty Fine SAND, wet (SM)	-4	43.5	3	

BORING_LOG_61N-0240 (BAKER - WESTERN BRANCH LINE).GPJ F&R.GDT 5/10/12

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.



Project No: 61N-0240

Elevation: Top of Pier

Drilling Method: Mud Rotary

Client: Michael Baker, Jr., Inc.

Total Depth: 125.0'

Hammer Type: Automatic

Project: Western Branch New 36-Inch RW Main

Boring Location: See F&R Drawing No. 2

Date Drilled: 4/4/12

City/State: Portsmouth, Virginia

Driller: FDI

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
		Very Loose, Gray, Silty Fine SAND, wet (SM)	1-1-3 -3	46.5	4	* Sample Blows obtained with an automatic hammer. Reported Sample Blows have been corrected to equivalent N ₆₀ energy. ** - Weigth of Hammer
		Same, Contains Wood Fragments at 53 Feet	** -1-1 -3	51.5	2	
0.0	55.0	Stiff, Gray, CLAY with little fine sand and thin fine sand lenses, wet (CL)	4-5-5 -10	56.5	10	
0.0	60.0	Very Stiff, Gray, CLAY and MARINE SHELL FRAGMENTS, wet (CL/SHELL)	7-8-12 -16	61.5	20	
0.0	66.0	Medium Dense, Gray, Fine to Medium SAND and MARINE SHELL FRAGMENTS, wet (SM/SHELL)	7-9-12 -16	67.0	21	
0.0	71.0	Stiff to Firm, Gray, Fine Sandy CLAY with trace to little marine shell fragments, wet (CL)	3-4-5 -8	72.0	9	
						74.0
					77.0	
					79.0	
					82.0	
					84.0	
					87.0	
					89.0	
				5-7-7 -8		14

BORING_LOG_61N-0240 (BAKER - WESTERN BRANCH LINE).GPJ F&R.GDT 5/10/12

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.



Project No: 61N-0240

Elevation: Top of Pier

Drilling Method: Mud Rotary

Client: Michael Baker, Jr., Inc.

Total Depth: 125.0'

Hammer Type: Automatic

Project: Western Branch New 36-Inch RW Main

Boring Location: See F&R Drawing No. 2

Date Drilled: 4/4/12

City/State: Portsmouth, Virginia

Driller: FDI

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks	
		Stiff to Firm, Gray, Fine Sandy CLAY with trace to little marine shell fragments, wet (CL)	** -3-4 -5	92.0	7	* Sample Blows obtained with an automatic hammer. Reported Sample Blows have been corrected to equivalent N ₆₀ energy. ** - Weigth of Hammer	
				94.0			
				1-3-4 -5	97.5		7
					99.5		
				1-4-4 -5	102.5		8
					104.5		
				1-3-4 -7	107.5		7
					109.5		
				1-3-4 -5	112.5		7
					114.5		
			1-3-4 -5	118.0	7		
				120.0			
0.0	121.0	Medium Dense, Gray, Silty Fine SAND with little marine shell fragments, wet (SM)	5-7-9 -13	123.0	16		
0.0	125.0			125.0			
		Boring Terminated at a Depth of 125 Feet Below the Top of Adjacent Pier Deck					

BORING_LOG_61N-0240 (BAKER - WESTERN BRANCH LINE).GPJ F&R.GDT 5/10/12

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.



Project No: 61N-0240

Elevation: ± Ground Surface

Drilling Method: Mud Rotary

Client: Michael Baker, Jr., Inc.

Total Depth: 100.0'

Hammer Type: Automatic

Project: Western Branch New 36-Inch RW Main

Boring Location: See F&R Drawing No. 2

Date Drilled: 4/5/12

City/State: Portsmouth, Virginia

Driller: FDI

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks	
0.0	0.5	Dark Brown, Clayey Fine SAND with trace organics, moist (Surficial Soil)	5-9-13 -10	0.0	22	* Sample Blows obtained with an automatic hammer. Reported Sample Blows have been corrected to equivalent N ₆₀ energy.	
		Medium Dense, Silty Fine SAND with trace to little clay, contains brick fragments and coarse aggregate, moist (FILL)	9-13-10 -9	2.0	23		
0.0	4.0	Medium Dense to Very Loose, Dark Brown, Silty Fine SAND with trace to little clay and trace marine shell fragments, moist to wet (SM, Possible Fill)	7-7-5 -5	4.0	12		
			4-4-3 -3	6.0	7		
			1-1-1 -1	8.0	2		
				10.0			
				10.0			Groundwater was judged to be encountered at a depth of approximately 10 feet during drilling.
0.0	12.0	Loose, Tan, Silty Fine SAND with lenses of organics, wet (SM)	5-5-4 -4	13.0	9		
				15.0			
0.0	17.0	Loose, Gray, Silty Fine SAND with trace marine shell fragments, wet (SM)	4-5-4 -4	18.0	9		
				20.0			
				22.0			
0.0	22.0	Very Soft, Gray, CLAY, wet (CH)	**.**-1 -0	23.0	1	** - Weight of Hammer	
				25.0			
			1-0-1 -1	28.0	1		
				30.0			
0.0	32.0	Stiff to Firm, Gray, Silty CLAY with trace fine sand and trace marine shell fragments, wet (CL)	8-4-5 -4	33.0	9		
				35.0			
			3-4-4 -7	38.0	8		

BORING_LOG_61N-0240 (BAKER - WESTERN BRANCH LINE).GPI F&R.GDT 5/10/12

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.



Project No: 61N-0240

Elevation: ± Ground Surface

Drilling Method: Mud Rotary

Client: Michael Baker, Jr., Inc.

Total Depth: 100.0'

Hammer Type: Automatic

Project: Western Branch New 36-Inch RW Main

Boring Location: See F&R Drawing No. 2

Date Drilled: 4/5/12

City/State: Portsmouth, Virginia

Driller: FDI

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
		Stiff to Firm, Gray, Silty CLAY with trace fine sand and trace marine shell fragments, wet (CL)		40.0		* Sample Blows obtained with an automatic hammer. Reported Sample Blows have been corrected to equivalent N ₆₀ energy.
			4-3-4 -7	43.0	7	
				45.0		
			3-4-4 -4	48.0	8	
				50.0		
			3-4-4 -8	53.0	8	
				55.0		
0.0	57.0	Loose, Gray, Silty Fine SAND with little clay and trace marine shell fragments, wet (SM)		58.0		
			4-4-4 -7	60.0	8	
				62.0		
0.0	62.0	Stiff, Gray, Fine Sandy CLAY with thin lenses of fine sand and trace marine shell fragments, wet (CL)		63.0		
			5-4-7 -12	65.0	11	
				68.0		
			5-4-5 -8	70.0	9	
				73.0		
			75.0	11		
0.0	77.0	Dense, Gray, Fine to Medium SAND and MARINE SHELL FRAGMENTS, wet (SM/SHELL)		78.0		
			25-25-20 -16		45	

BORING_LOG_61N-0240 (BAKER - WESTERN BRANCH LINE).GPI F&R.GDT 5/10/12

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.



Project No: 61N-0240

Elevation: ± Ground Surface

Drilling Method: Mud Rotary

Client: Michael Baker, Jr., Inc.

Total Depth: 100.0'

Hammer Type: Automatic

Project: Western Branch New 36-Inch RW Main

Boring Location: See F&R Drawing No. 2

Date Drilled: 4/5/12

City/State: Portsmouth, Virginia

Driller: FDI

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks	
0.0	82.0	Dense, Gray, Fine to Medium SAND and MARINE SHELL FRAGMENTS, wet (SM/SHELL)		80.0		* Sample Blows obtained with an automatic hammer. Reported Sample Blows have been corrected to equivalent N ₆₀ energy.	
		Stiff to Firm, Gray, CLAY with little marine shell fragments and trace fine sand, wet (CL)	9-5-9 -17	83.0	14		
				85.0			
			3-3-5 -8	88.0	8		
				90.0			
0.0	92.0	Loose to Medium Dense, Gray, Silty Fine SAND with little clay and trace to little marine shell fragments, wet (SM)	4-4-4 -8	93.0	8		
				95.0			
				7-7-9 -17	98.0		16
					100.0		
0.0	100.0	Boring Terminated at a Depth of 100 Feet					

BORING_LOG_61N-0240 (BAKER - WESTERN BRANCH LINE).GPJ F&R.GDT 5/10/12

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.



KEY TO BORING LOG SOIL CLASSIFICATIONS

Particle Size and Proportion

Verbal descriptions are assigned to each soil sample or stratum based on estimates of the particle size of each component of the soil and the percentage of each component of the soil.

Particle Size Descriptive Terms		Proportion/ Descriptive Terms		
Soil Component	Particle Size	Component	Term	Percentage
Boulder	> 12 inch	Major	Uppercase Letters (e.g., SAND, CLAY)	> 50%
Cobble	3 - 12 inch			
Gravel-Coarse	3/4 - 3 inch	Secondary	Adjective (e.g., sandy, clayey)	20%-50%
-Fine	#4 - 3/4 inch			
Sand-Coarse	#10 - #4			
-Medium	#40 - #10	Minor	Some Little Trace	15%-25% 5%-15% 0%-5%
-Fine	#200 - #40			
Silt (non-cohesive)	< #200			
Clay (cohesive)	< #200			

Notes: 1. Particle size is designated by U.S. Standard Sieve Sizes.
 2. Because of the small size of the split-spoon sampler relative to the size of gravel, the true percentage of gravel may not be accurately estimated.

Density or Consistency

The standard penetration resistance values (N-values) are used to describe the density of coarse-grained soils (GRAVEL, SAND) or the consistency of fine-grained soils (SILT, CLAY). Sandy silts of very low plasticity may be assigned a density instead of a consistency.

DENSITY		CONSISTENCY	
Term	N-Value	Term	N-Value
Very Loose	0 - 4	Very Soft	0 - 1
Loose	5 - 10	Soft	2 - 4
Medium-Dense	11 - 30	Firm	5 - 8
Dense	31 - 50	Stiff	9 - 15
Very Dense	> 50	Very Stiff	16 - 30
		Hard	> 30

Notes: 1. The N-value is the number of blows of a 140 lb. Hammer freely falling 30 inches required to drive a standard split spoon sampler (2.0 in. O.D., 1 3/8 in. I.D.) 12 inches into the soil after properly seating the sampler six inches.
 2. When encountered, gravel may increase the N-value of the standard penetration test and may not accurately represent the in-situ density or consistency of the soil sample.

rev. APR 2005



SOIL CLASSIFICATION CHART - Adapted from ASTM D 2487

MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES	CLASSIFICATION CRITERIA			
COARSE-GRAINED SOILS - More than 50% retained on No. 200 sieve*	GRAVELS - 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	$C_u = D_{60}/D_{10}$ Greater than 4 $C_z = D_{10} \times D_{60}$ Between 1 and 3 Not meeting both criteria for GW		
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines			
		GRAVELS WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures	Atterberg limits plot below "A" line and plasticity index greater than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols	
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits plot above "A" line and plasticity index greater than 7		
	SANDS - More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS	SW	Well-graded sands and gravelly sands, little or no fines	$C_u = D_{60}/D_{10}$ Greater than 6 $C_z = D_{10} \times D_{60}$ Between 1 and 3 Not meeting both criteria for SW		
			SP	Poorly graded sands and gravelly sands, little or no fines			
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures	Atterberg limits plot below "A" line and plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols	
			SC	Clayey sands, sand-clay mixtures	Atterberg limits plot above "A" line and plasticity index greater than 7		
					Classification on basis of percentage of lines GW, GP, SW, SP GM, GC, SM, SC		
					Borderline Classification requiring use of dual symbols		
FINE-GRAINED SOILS - 50% or more passes No. 200 sieve*	SILTS AND CLAYS - Liquid limit 50% or less	ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	PLASTICITY CHART For classification of fine-grained soils and fine fraction of coarse-grained soils. Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols. Equation of A-line: $PI = 0.73 (LL - 20)$			
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays				
		OL	Organic silts and organic silty clays of low plasticity				
	SILTS AND CLAYS - Liquid limit GREATER THAN 50%	MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts				
		CH	Inorganic clays of high plasticity, fat clays				
		OH	Organic clays of medium to high plasticity				
		PT	Peat, muck and other highly organic soils				
	Highly Organic Soils						

*Based on the material passing the 3-in. (75-mm) sieve.



FROEHLING & ROBERTSON, INC.

**LABORATORY TEST
SUMMARY SHEET**

Sheet: 1 of 1

Project No: 61N-0240

Client: Michael Baker, Jr., Inc.

Project: Western Branch New 36-Inch RW Main

City/State: Portsmouth, Virginia

Boring/ Sample No.	Depth (ft)	LL	PL	PI	Water Content (%)	% Gravel	% Sand	% Fines	USCS Class.	AASHTO Class.
B-01	19.0	NP	NP	NP	20.9	0.0	92.3	7.7	SP-SM	A-3
B-02	82.0	39	12	27	36.8	0.0	48.3	51.7	CL	A-6
B-03	29.0	98	38	60	70.6	0.0	6.7	93.3	CH	A-7-5

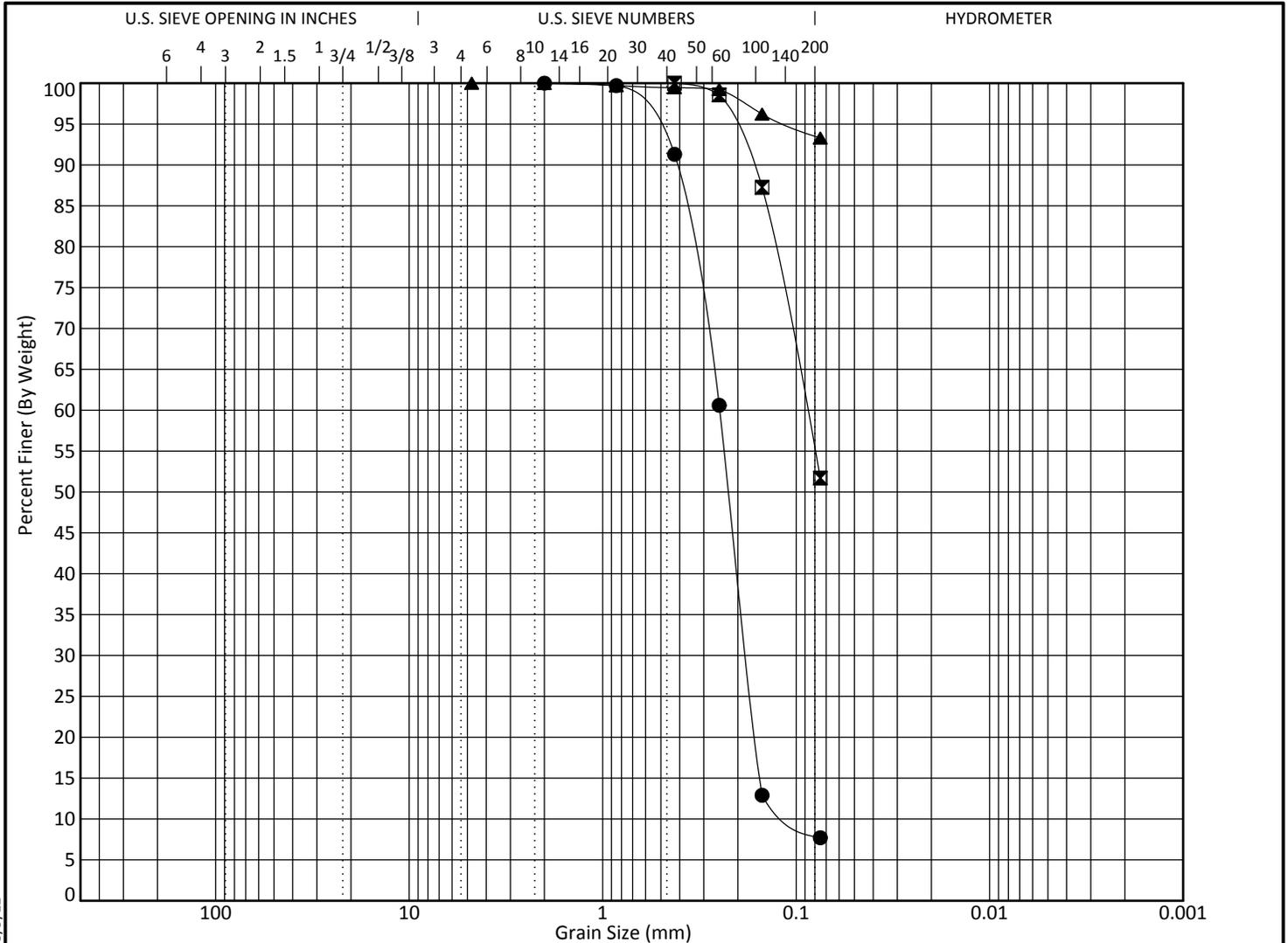


Project No: 61N-0240

Client: Michael Baker, Jr., Inc.

Project: Western Branch New 36-Inch RW Main

City/State: Portsmouth, Virginia



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring No.	Depth	Classification					LL	PL	PI	Cc	Cu
● B-01	at 19.0	POORLY GRADED SAND with SILT (SP-SM)					NP	NP	NP	1.28	2.44
☒ B-02	at 82.0	SANDY LEAN CLAY WITH SHELL FRAGMENTS (CL)					39	12	27		
▲ B-03	at 29.0	FAT CLAY (CH)					98	38	60		
Boring No.	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● B-01	at 19.0	2	0.248	0.18	0.102	0.0	92.3	7.7			
☒ B-02	at 82.0	0.425	0.088			0.0	48.3	51.7			
▲ B-03	at 29.0	4.75				0.0	6.7	93.3			

U.S. GRAIN SIZE 61N-0240 (BAKER - WESTERN BRANCH LINE).GPI F&R.GDT 5/9/12

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APPENDIX I

Test Hole Results (Pipe)

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 WILLIAMSBURG, VIRGINIA 23185
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 FAX:(757)903-4469

COVER SHEET

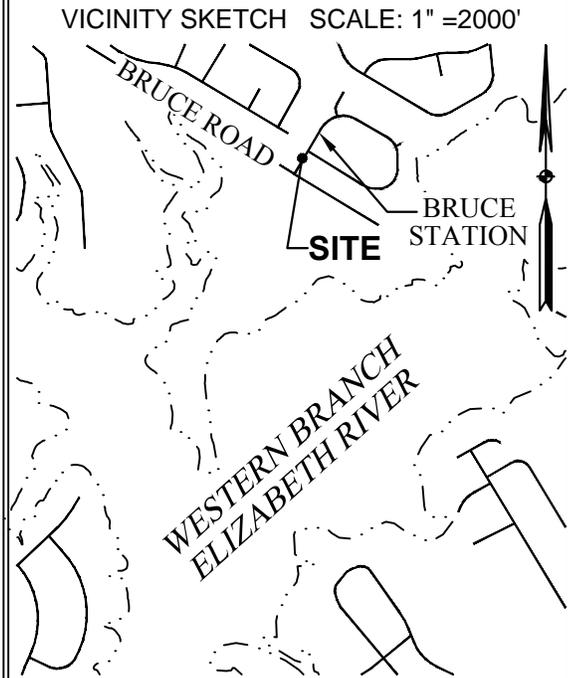
DATE: 1/16/2015

TEST HOLE # 1 & 2

PROJECT NAME	PROJECT NO.	LOCATION	TEST HOLE CREW
NORFOLK RAW WATER LINE BRUCE ROAD	12440-12-2	BRUCE STATION CHESAPEAKE, VA.	RW, JJ

SURVEY NOTES:

- HORIZONTAL DATUM IS REFERENCED TO THE VIRGINIA STATE PLANE COORDINATE SYSTEM OF 1983, SOUTH ZONE, NAD 1983/1994 HARN. COORDINATE VALUES ARE SHOWN IN U.S. SURVEY FEET. CITY OF CHESAPEAKE GEODETIC CONTROL STATION NO. 157 WAS UTILIZED TO ESTABLISH THE COORDINATE VALUES FOR THIS SURVEY.
- VERTICAL DATUM IS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988(NAVD88). ELEVATIONS ARE SHOWN IN FEET. CITY OF CHESAPEAKE GEODETIC CONTROL STATION NO. 157 WAS UTILIZED TO ESTABLISH THE ELEVATIONS FOR THIS SURVEY. STATION NO. 157 ELEVATION=8.6'.
- THIS TEST HOLE DATA SHEET IS BASED ON A TOPOGRAPHIC SURVEY PREPARED BY ROUSE-SIRINE ASSOCIATES ON MAY 6, 2011 AND UPDATED ON APRIL 17, 2014.
- UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON QUALITY LEVEL "B" FIELD MARKINGS AND UTILITY DRAWINGS OF RECORD. RSA CANNOT GUARANTEE THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITIES SHOWN ON THIS SURVEY. FURTHERMORE, RSA CANNOT GUARANTEE UTILITY LINES ARE LIVE OR ABANDONED. PRIOR TO CONSTRUCTION OR EXCAVATION, CONTACT MISS UTILITY @ 811 OR 1-800-522-7001 TO VERIFY THE LOCATION OF THE UNDERGROUND UTILITIES.



TEST HOLE DATA SET
 AT
NORFOLK RAW WATER LINE - BRUCE ROAD
CHESAPEAKE, VIRGINIA
 FOR



Michael Baker Jr., Inc.



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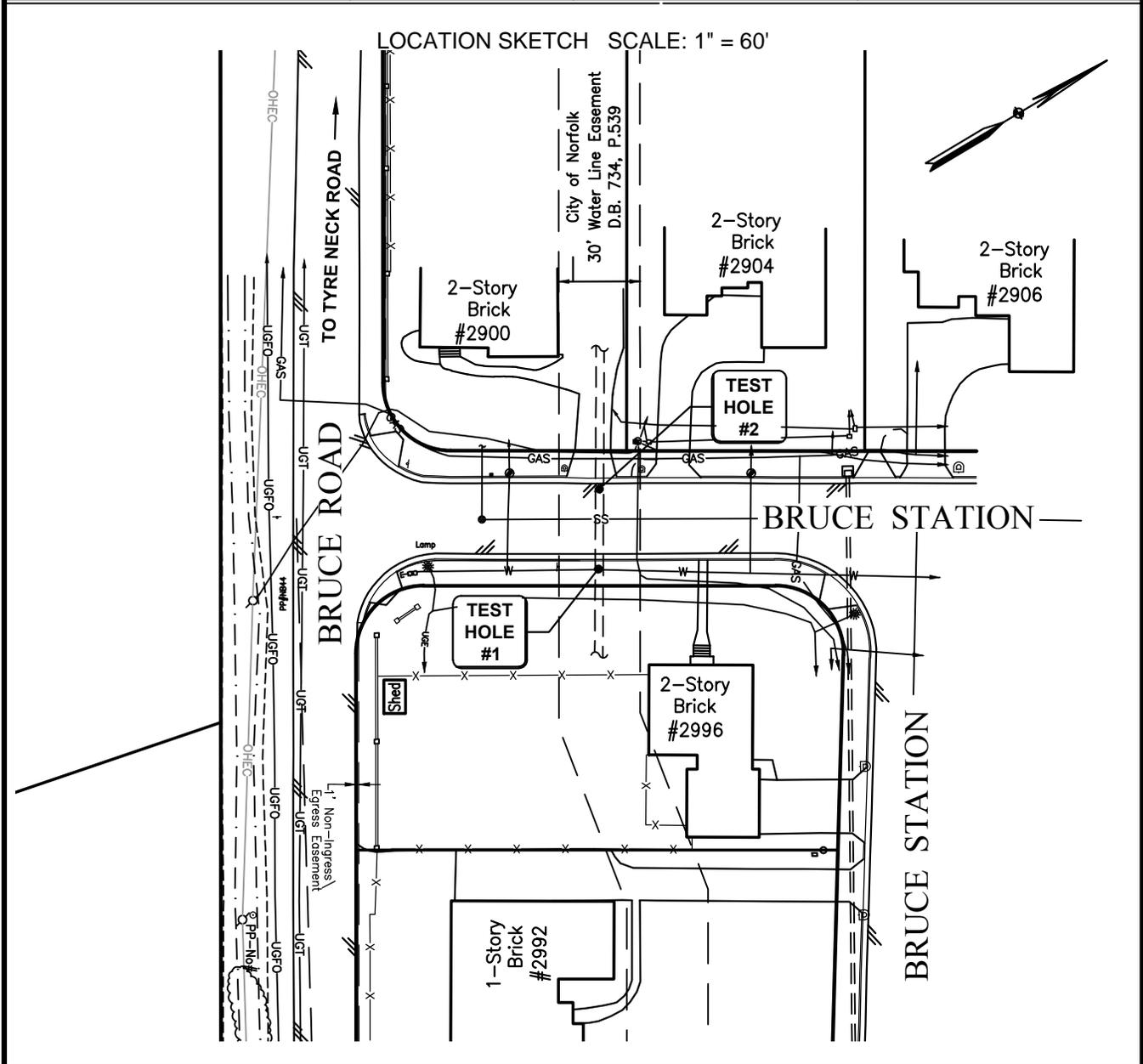
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 FAX:(757)499-9136

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 WILLIAMSBURG, VIRGINIA 23185
 TEL.(757)903-4695
 FAX:(757)903-4469

COVER SHEET

DATE: 01/16/2015 TEST HOLE # 1 & 2

PROJECT NAME	PROJECT NO.	LOCATION	TEST HOLE CREW
NORFOLK RAW WATER LINE BRUCE ROAD	12440-12-2	BRUCE STATION CHESAPEAKE, VA.	RW, JJ



TEST HOLE	NORTHING	EASTING	TOP of UTILITY ELEVATION	DESCRIPTION
#1	3,470,708.3	12,099,363.0	9.83'	36" WATER
#2	3,470,723.9	12,099,337.3	10.08'	36" WATER



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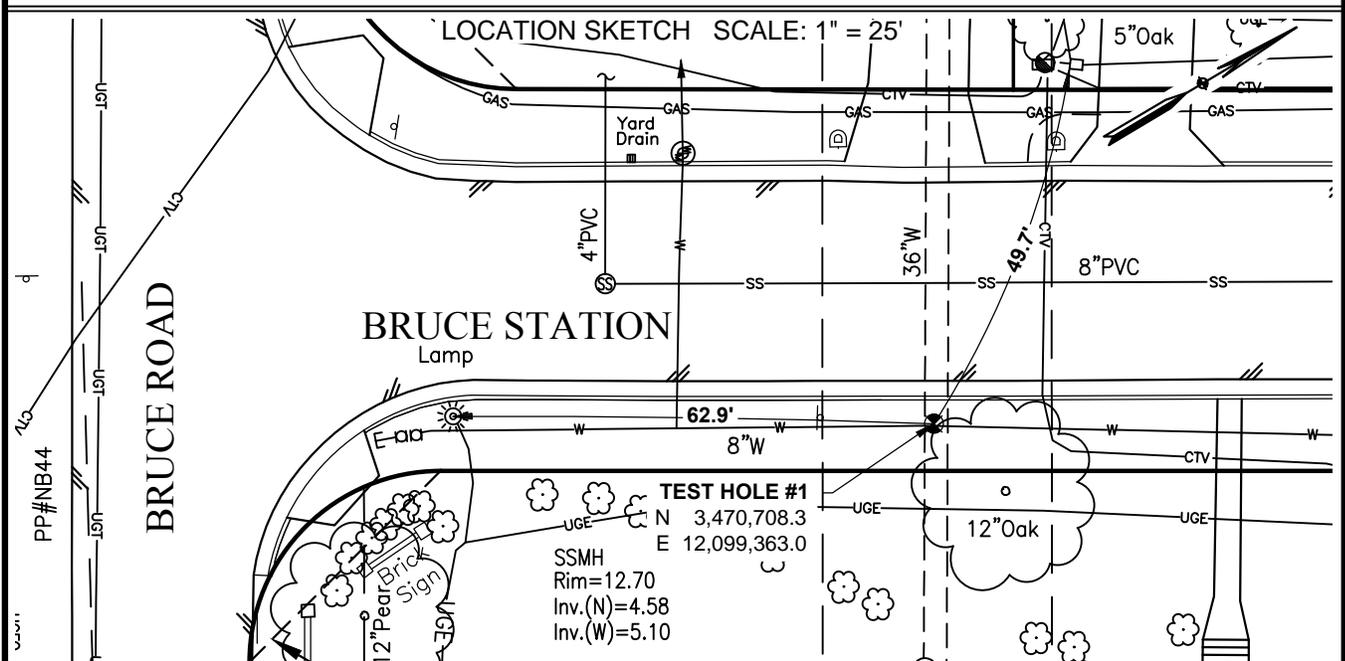
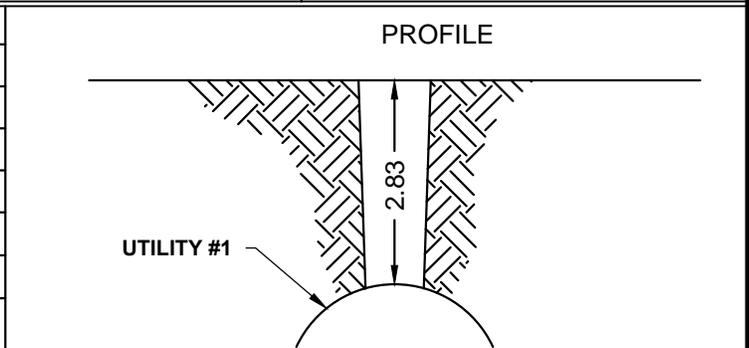
UTILITY TEST HOLE DATA FORM

DATE: 1/16/2015 TEST HOLE # 1

PROJECT NAME	PROJECT NO.	LOCATION	TEST HOLE CREW
NORFOLK RAW WATER LINE BRUCE ROAD	12440-12-2	BRUCE STATION CHESAPEAKE, VA.	RW, JJ
TARGET UTILITY	PAVEMENT TYPE	SOIL DESCRIPTION	
UTILITY 1 36" WATER	DRY, GRASS	DIRT	
ASPHALT DEPTH	SURVEY MARKER SET	SURVEY MARKER LOCATION	
N/A	NONE NOTED	OVER TEST HOLE	

RESTORATION COMPACTED BACKFILL, REPLACE GRASS PLUG * ELEVATION DATUM: NAVD88

DESCRIPTION	UTILITY 1
UTILITY FOUND	36" WATER
MATERIAL TYPE	CONCRETE
CONDITION	GOOD
INSIDE DIAMETER	36" I.D.
EXIST. GRADE	12.6'
DEPTH TO TOP	2.83'
TOP OF UTILITY ELEVATION *	9.8'



NOTES/REMARKS: TEST HOLE IS SITUATED 3.2' BEHIND BACK OF CURB



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UTILITY TEST HOLE PHOTOGRAPHS

DATE: 1/16/2015

TEST HOLE # 1

PROJECT NAME	PROJECT NO.	LOCATION	TEST HOLE CREW
NORFOLK RAW WATER LINE BRUCE ROAD	12440-12-2	BRUCE STATION CHESAPEAKE, VA.	RW, JJ



PRE-EXCAVATION



UTILITY #1



UTILITY #1



DEPTH OF UTILITY #1



UTILITY #1



RESTORATION



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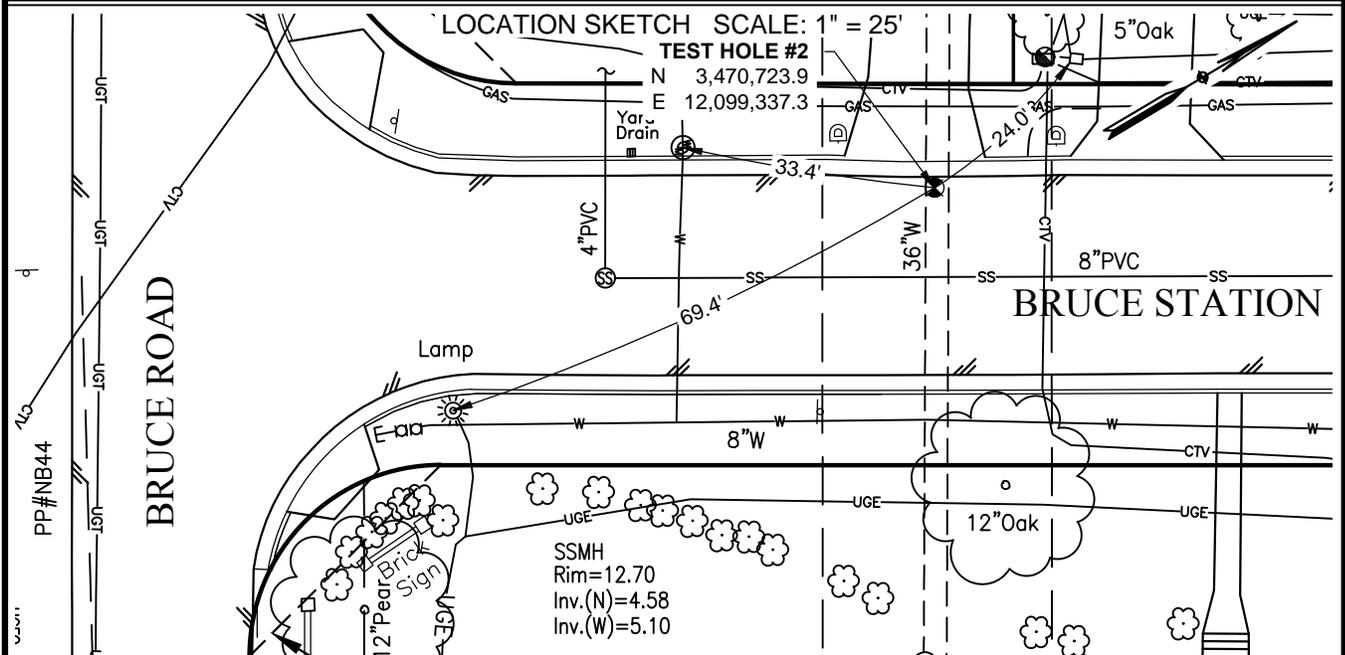
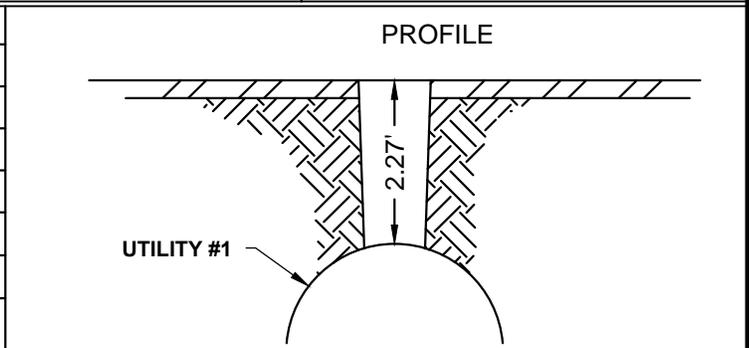
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WILLIAMSBURG, VIRGINIA 23185
TEL.(757)903-4695
FAX:(757)903-4469

UTILITY TEST HOLE DATA FORM

DATE: 1/16/2015 TEST HOLE # 2

PROJECT NAME	PROJECT NO.	LOCATION	TEST HOLE CREW
NORFOLK RAW WATER LINE BRUCE ROAD	12440-12-2	BRUCE STATION CHESAPEAKE, VA.	RW, JJ
TARGET UTILITY	PAVEMENT TYPE	SOIL DESCRIPTION	
UTILITY 1 36" WATER	DRY, ASPHALT	ROCK & DIRT	
ASPHALT DEPTH	SURVEY MARKER SET	SURVEY MARKER LOCATION	
3"	NONE NOTED	OVER TEST HOLE	
RESTORATION	COMPACTED BACKFILL, COLD ASPHALT PATCH	* ELEVATION DATUM: NAVD88	

DESCRIPTION	UTILITY 1
UTILITY FOUND	36" WATER
MATERIAL TYPE	CONCRETE
CONDITION	GOOD
INSIDE DIAMETER	36" I.D.
EXIST. GRADE	12.35'
DEPTH TO TOP	2.27'
TOP OF UTILITY ELEVATION *	10.08'



NOTES/REMARKS



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 FAX:(757)903-4469

UTILITY TEST HOLE PHOTOGRAPHS

DATE: 1/16/2015

TEST HOLE # 2

PROJECT NAME	PROJECT NO.	LOCATION	TEST HOLE CREW
NORFOLK RAW WATER LINE BRUCE ROAD	12440-12-2	BRUCE STATION CHESAPEAKE, VA.	RW, JJ



PRE-EXCAVATION



UTILITY #1



UTILITY #1



DEPTH OF UTILITY #1



UTILITY #1



RESTORATION

APPENDIX J

Contractor's Use of Temporary Facilities and Staging Areas

*36-Inch Raw Water Main Improvements-
Replacement of Western Branch
Elizabeth River Crossing (Line 2)
February 2015
City of Norfolk, Department of Utilities*



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Appendix J

Contractor's Use of Temporary Facilities and Staging Areas

1. The Contractor shall provide at its own expense and without liability to the City any additional land and access thereto that the Contractor may desire for temporary construction facilities, staging areas, or storage of materials. The Contractor shall not use private property in connection with the Work unless prior written permission is obtained from the property owner.
2. The Contractor's use of the staging area will have the same requirements as the construction activity area in the Contract Documents.
3. The Contractor's use of the staging area shall be in compliance with all City ordinances to include:
 - A. Vector Control – the contractor shall be responsible for keeping the grass mowed and keeping the area in a clean and orderly condition.
 - B. Erosion Control – erosion control such as silt fence, inlet protection, etc. shall be provided at the site in accordance with City code and shall comply with the same requirements included in the contract documents.
 - C. Noise Control – the Contractor shall be responsible for complying with City noise ordinances and shall comply with the same requirements included in the contract documents.
 - D. Graffiti Control – the contractor shall remove/erase all graffiti and or other defilement of facilities on the staging area within two working days.
4. The Contractor shall be responsible for the security and safety of all staging area facilities including, but not limited to, all equipment, materials, site structures, and construction thereon. All security measures deemed necessary by the Contractor to comply with this requirement shall be at the Contractor's expense and at no additional cost to the City. The Contractor shall be responsible for all site security until final acceptance of the Work by the City.
5. The Contractor shall maintain the staging area in an orderly and clean condition and shall at intervals of no more than three (3) days and at its expense, remove and legally dispose of accumulations of rubbish or refuse materials, surplus concrete, mortar and excavated materials not required on the project. Washings from concrete mixers or mixing boxes shall not be deposited directly or indirectly in the drainage or sewer system or on paved streets.
6. The Contractor shall keep the site, inclusive of vehicular and pedestrian traffic routes through the site, free of dirt and dust by periodic blading, power brooming, watering or other approved means. Road surfaces adjacent to the area shall be cleaned of soil with mechanical brooms or other approved methods at the end of each working day.
7. The Contractor shall confine all equipment, the storage of materials and equipment, and the operations of workmen to areas permitted by law, ordinances, permits, or the requirements of the Contract Documents.

8. Upon completion of the use of the staging area, the Contractor shall remove and legally dispose of all rubbish, surplus or discarded materials, false work, forms, temporary structures, field offices, signs, temporary erosion and siltation control measures, and equipment and machinery, and shall leave the site in the conditions existing before the Work was started, to the satisfaction of the City.
9. The Contractor shall, during the progress of the Work and as directed by the City, remove from the City's property and from all public and private property and rights-of-way, at its own expense, all temporary structures, rubbish, debris, piles of earth, foreign matter, and waste materials resulting from his operations. The site of the Work shall be restored to the conditions existing before the Work was started, to the satisfaction of the Owner. Lawns, pavements, sidewalks, and other surfaces shall be preserved where practicable, but if damaged, shall be fully restored.
10. The Contractor shall be responsible for the safe storage of material furnished by him or to him, and accepted by him and intended for the work.
11. Above ground fuel storage tanks, lubricants, oil, grease and other petroleum products shall be stored in a fashion to prevent spills. The contractor shall be responsible for cleaning up any spills and shall comply with all applicable regulations pertaining to storage and use of hazardous products.
12. Construction staging areas shall not have more than 2 points of ingress/egress to the site.
13. Construction staging areas shall have a 6 foot high chain link fence around the perimeter and all activities associated with the staging shall be contained within the fenced area. The fence shall have a green and black 8mil woven geotextile screening fabric 6 feet high securely attached to the fence every 24 inches at the top and bottom of the fence.

APPENDIX K

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APPENDIX L

Host City Approvals

- **City of Portsmouth, Wetlands Review
Exclusion Letter**
- **City of Portsmouth, Site Plan Approval**
- **City of Chesapeake, Site Plan Approval**

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RECEIVED
SEP 18 2014
Michael Baker Jr. Inc.

September 17, 2014

G. Donald Gartrell, P.E., Senior Project Manager
Michael Baker, Jr., Inc.
272 Bendix Road, Suite 400
Virginia Beach, Virginia 23452

SUBJECT: WETLANDS APPLICATION
(VMRC #14-1388 – City of Norfolk Public Utilities (Raw Water Main Improvements))

Dear Mr. Gartrell:

This letter is in reference to the City of Norfolk Public Utilities Department's Joint Permit Application submitted to the Virginia Marine Resources Commission for **improvements to a raw water main** that falls within the limits of Portsmouth, Virginia. According to Portsmouth City Code Section 39-24 (General Permitted Uses and Activities on Wetlands), the proposed project is permitted by law. **The project will not require the Wetlands Board review.**

Please be advised that a permit from the Army Corps of Engineers and/or Virginia Marine Resources Commission may still be needed. In addition, please contact the city's Permits and Inspections Department at 757-393-8531 to determine if other permits are required for your project. If you should have any questions, please contact me at your convenience.

Sincerely,

Stacy Porter, Senior Planner
Portsmouth Wetlands Board Secretary

xc: Portsmouth Wetlands Board
Virginia Marine Resources Commission
Virginia Institute of Marine Science
US Army Corps of Engineers

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City of Portsmouth, Site Plan Approval
(To Be Provided by Addendum when Received)

*36-Inch Raw Water Main Improvements-
Replacement of Western Branch
Elizabeth River Crossing (Line 2)
February 2015
City of Norfolk, Department of Utilities*



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March 10, 2015

Mr. G. Donald Gartrell, III, PE
Michael Baker, Jr., Inc.
272 Bendix Road
Suite 400
Virginia Beach, VA 23452

**SUBJECT: Norfolk Watermain Replacement
AC# 144092 00**

Dear Mr. Gartrell:

Enclosed is one (1) copy of the site plan for the referenced project received on February 20, 2015 and approved for construction of water improvements, and erosion & sediment control. This approval is based on your certification that the design of all improvements conforms to applicable sections of the Chesapeake City Code and to all volumes of the current Public Facilities Manual. Any nonconforming designs must be corrected prior to acceptance of the improvements.

This approval is subject to:

1. The individual responsible for land disturbing activities holding a Certificate of Competence.

It is the developer's responsibility to obtain the appropriate clearances from the Virginia Department of Health and Department of Environmental Quality. Improvements within any wetlands area may require Army Corps of Engineers, Department of Environmental Quality, Coast Guard or the Local Wetlands Board approval. It is the responsibility of the developer and his consultant engineer to determine if approval is required from these or any other regulatory agencies. Approval and all permits from the proper environmental authorities shall be obtained prior to land disturbing.

This approval is valid for a period of five (5) years. Permits requested subsequent to March 10, 2020 will be subject to the regulations and specifications of the City of Chesapeake which are in effect at that time.

Any deviation from the approved plan to include field conditions that are different will have to be submitted as a plan revision and approved by this department prior to construction.

Prior to construction:

1. Contact the Permits Engineer, Mr. David G. Dombroski (757) 382-6304, for the following:
 - a) A Land Disturbing Permit must be obtained from this department prior to commencing any land disturbing. The permittee must provide a Certificate of Competence that qualifies the contractor to perform land disturbing activities.

Excavation shall be limited to the specified areas indicated on the approved construction plan. Excavation not conducted for the sole purpose of preparing a site for construction, as shown on the approved construction plan, requires a Use Permit in accordance with Chapter 26, Article VII of the City Code, if the excavated material is removed from the site. Prior to removal of any excavated material from the site, all bonds and permits necessary for plan implementation shall be posted and obtained.
 - b) A Right-of-Way Permit must be obtained prior to commencing work within a City maintained right-of-way or easement.
 - c) Once these permits are obtained, it is required that the Permits Engineer be notified at least forty-eight (48) hours prior to commencement of construction of public facilities so that inspection may be scheduled.
2. Permit approval from the proper environmental authorities shall be obtained.
3. Prior to beginning construction, it is the developer's responsibility to contact Virginia Power to ensure the proposed improvements do not conflict with restrictions that apply within their rights-of-way and/or easements.

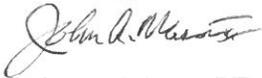
Prior to final inspection, acceptance, and activation of any public facilities or utilities, it will be necessary that the following documents be submitted to this department:

1. A Defect Bond to guarantee the performance of the public facilities for a period of two (2) years from the date of acceptance of all physical improvements.
2. Site engineer must submit a Statement of Completion to the Department of Development and Permits.
3. A set of reproducible "Construction Record Drawings" for these public facilities. These drawings shall consist of plans that have been corrected to include all construction amendments.

4. Submit additional documents as required by the Department of Public Utilities. A letter will be forthcoming from that Department requesting this information. Any required approvals or certificates from Virginia Department of Health and Department of Environmental Quality must be received by Department of Public Utilities.

If I can be of further assistance, you may reach me at (757) 382-6272.

Sincerely,



John A. Mason PE
Engineer II

Enclosure (1)

cc: Mr. John King, Zoning Administrator (w/enclosure - 1)
Department of Public Utilities (w/enclosure - 1)
Mr. Thomas D. Crawford, P.E., Development Construction (w/enclosures - 3)
Mr. Harold Creason, Fire Protection Plans Examiner
File Room (w/enclosures - 2)
Barbara Brumbaugh, Environmental Quality Coordinator, Public Works
Lance Brown, Public Works Operations, Stormwater

Virginia Department of Health
830 Southampton Avenue, Room 2058
Norfolk, VA 23510

CITY OF CHESAPEAKE
DEPARTMENT OF
DEVELOPMENT AND PERMITS

36" Raw Water Main Improvements - AC # 144092 00

ITEM	QUANTITY	UNIT	UNIT PRICE	TOTAL	PERCENTAGE COMPLETE	ADJUSTED FACTOR	BOND AMOUNT
EROSION & SEDIMENT CONTROL							
TOTAL DISTURBED ACREAGE	0.78	1					
DISTURBED ACREAGE (< or = 1 ACRE)	1	EA	\$1,000.00	\$1,000.00	0	1	\$1,000.00
ADDITIONAL DISTURBED ACREAGE (> 1 ACRE)	0	EA	\$500.00	\$0.00	0	1	\$0.00
CHECK DAM (ROCK)		EA	\$700.00	\$0.00	0	1	\$0.00
SILT FENCE	1400	LF	\$2.75	\$3,850.00	0	1	\$3,850.00
INLET PROTECTION	6	EA	\$100.00	\$600.00	0	1	\$600.00
CONSTRUCTION ENTRANCE	1	EA	\$4,000.00	\$4,000.00	0	1	\$4,000.00
RESTORATION (GRADE & VEGETATION)	0.5	AC	\$3,500.00	\$1,750.00	0	1	\$1,750.00
DIVERSION DIKE		LF	\$5.00	\$0.00	0	1	\$0.00
CONSTRUCTION ROAD STABILIZATION		SY	\$5.00	\$0.00	0	1	\$0.00
SEDIMENT TRAP/BASIN (PER RUNOFF ACRE)		AC	\$1,000.00	\$0.00	0	1	\$0.00
				LAND DISTURBING PERMIT BOND SUB-TOTAL			\$11,200.00
						8% Contingency	\$896.00
						15% A&E	\$1,680.00
						HB-2029 - Add 10%	\$1,120.00
				LAND DISTURBING PERMIT BOND TOTAL			\$12,320.00
						PERMIT FEES	\$150.00

APPENDIX M

Regulatory Agency Approvals

- **Virginia Marine Resources Commission**
 - **Permit (Approved 3/24/15 – *To Be Provided by Addendum when Received*)**
 - **Letter Regarding Removal of Existing Raw Water Main**
- **U.S. Army Corps of Engineers**

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COMMONWEALTH of VIRGINIA

Marine Resources Commission

2600 Washington Avenue
Third Floor
Newport News, Virginia 23607

Molly Joseph Ward
Secretary of Natural Resources

John M.R. Bull
Commissioner

October 15, 2014

RECEIVED
OCT 16 2014
Michael Baker Jr. Inc.

David Riley
City of Norfolk, Department of Utilities
c/o Michael Baker, Jr., Inc.
272 Bendix Road, Suite 400
Virginia Beach, VA 23452

RE: VMRC #14-1388

Dear Mr. Riley:

I am writing to acknowledge receipt of your application seeking authorization to install a 36-inch steel raw water main, using directional drilling technology, beneath the Western Branch of the Elizabeth River which will extend from the vicinity of 12 Sandie Point Lane in Portsmouth to the intersection of Bruce Station and Bruce Road Chesapeake. Your proposed water main project requires a permit from the Marine Resources Commission. Removal of the existing 36-inch iron water main and associated support structure does not require VMRC authorization.

Prior to commencing your project, you may also need authorization from the U. S. Army Corps of Engineers, 803 Front Street, Norfolk, Virginia 23510. We forwarded the application to the Corps for their review.

If I may be of further assistance, please do not hesitate to call on me.

Sincerely,

Justine R. Woodward
Environmental Engineer

JRW/jaj

HM

Cc: Applicant
City of Chesapeake

An Agency of the Natural Resources Secretariat

www.mrc.virginia.gov

Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD



COMMONWEALTH of VIRGINIA

Marine Resources Commission

2600 Washington Avenue

Third Floor

Newport News, Virginia 23607

Molly Joseph Ward
Secretary of Natural Resources

John M.R. Bull
Commissioner

October 15, 2014

MEMORANDUM

TO: City of Norfolk Dept of Utilities c/o Michael Baker Jr., Inc.,

RE: VMRC #14-1388

Attached is a copy of the public notice for your proposed project, which has been sent to your local newspaper. Since your application for permit cannot be completed until evidence of publication of this notice is received, you can expedite the process by forwarding us a copy of the notice when it appears in your local paper. Please attach the copy of the notice to this sheet, indicate the date it appeared in your newspaper, affix your signature, and return to:

Virginia Marine Resources Commission
Habitat Management Division
2600 Washington Avenue, 3rd Floor
Newport News, Virginia, 23607

(Please attach copy of the notice here)

This advertisement appeared in:

(Name of Newspaper)

(Date of Publication)

Signature of Applicant

JRW:jaj
HM

An Agency of the Natural Resources Secretariat
www.mrc.virginia.gov



COMMONWEALTH of VIRGINIA

Marine Resources Commission

2600 Washington Avenue
Third Floor
Newport News, Virginia 23607

Molly Joseph Ward
Secretary of Natural Resources

John M.R. Bull
Commissioner

October 15, 2014

The Virginian Pilot
Attn: Legal Ads Department
150 West Brambleton Avenue
Norfolk, VA 23510

Dear Sir or Madam:

In compliance with a Marine Resources Commission regulation, we request that you publish the following notice in one issue of your newspaper as soon as possible. Because of legal requirements, it is important that you complete and return the enclosed Certification of Publication to this office as soon as possible.

PUBLIC NOTICE

Notice is hereby given that the City of Norfolk Department of Utilities is requesting authorization from the Marine Resources Commission to install a 36-inch steel raw water main, using directional drilling technology, beneath the Western Branch of the Elizabeth River which will extend from the vicinity of 12 Sandie Point Lane in Portsmouth to the intersection of Bruce Station and Bruce Road Chesapeake.

Send Comments/inquiries within 15 days to: Marine Resources Commission, Habitat Management Division, 2600 Washington Avenue, 3rd Floor, Newport News, VA 23607.

Please submit the invoice to the Agent for the City: Don Gartrell, III, Michael Baker Jr., Inc., 272 Bendix Road, Site 400 Virginia Beach, VA 23452. You can reach him at 757 631-5427, or by e-mail: dgartrell@mbakerintl.com.

Sincerely,

Justine R. Woodward
Environmental Engineer

JRW:maj
HM
Enclosure

Cc: Applicant *An Agency of the Natural Resources Secretariat*
Agent www.mrc.virginia.gov

Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD



COMMONWEALTH of VIRGINIA

Marine Resources Commission

2600 Washington Avenue

Third Floor

Newport News, Virginia 23607

Molly Joseph Ward
Secretary of Natural Resources

John M.R. Bull
Commissioner

October 15, 2014

Allen Toby Hedgepeth
3824 Bruce Road
Chesapeake, VA 23321

Re: VMRC # 14-1388

Dear Adjacent Property Owner:

We have received an application submitted by the City of Norfolk, Department of Utilities, seeking approval from the Virginia Marine Resources Commission to install a 36-inch steel raw water main, using directional drilling technology, beneath the Western Branch of the Elizabeth River which will extend from the vicinity of 12 Sandie Point Lane in Portsmouth to the intersection of Bruce Station and Bruce Road Chesapeake.

They provided your name as an adjacent property owner, therefore, we are advising you of this project. Attached please find a copy of the drawings indicating the proposed work to be done.

If you have any questions about the details of this project, please feel free to contact me. If I cannot answer your questions, I may need to refer you to the applicant or your may wish to contact the applicant directly. If we do not hear from you by October 31, 2014, we will assume that you have no objections to the project.

Sincerely,

A handwritten signature in cursive script that reads "Justine R. Woodward".

Justine R. Woodward
Environmental Engineer

JRW/jaj

HM

Enclosure

cc: Applicant
Agent

An Agency of the Natural Resources Secretariat

www.mrc.virginia.gov

Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD



COMMONWEALTH of VIRGINIA

Marine Resources Commission

2600 Washington Avenue

Third Floor

Newport News, Virginia 23607

Molly Joseph Ward
Secretary of Natural Resources

John M.R. Bull
Commissioner

October 15, 2014

William & Stephanie Winslow
3821 Bruce Road
Chesapeake, VA 23321

Re: VMRC # 14-1388

Dear Adjacent Property Owner:

We have received an application submitted by the City of Norfolk, Department of Utilities, seeking approval from the Virginia Marine Resources Commission to install a 36-inch steel raw water main, using directional drilling technology, beneath the Western Branch of the Elizabeth River which will extend from the vicinity of 12 Sandie Point Lane in Portsmouth to the intersection of Bruce Station and Bruce Road Chesapeake.

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Sincerely,

A handwritten signature in cursive script that reads "Justine R. Woodward".

Justine R. Woodward
Environmental Engineer

JRW/jaj
HM
Enclosure
cc: Applicant
Agent

An Agency of the Natural Resources Secretariat

www.mrc.virginia.gov

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COMMONWEALTH of VIRGINIA

Marine Resources Commission

2600 Washington Avenue

Third Floor

Newport News, Virginia 23607

Molly Joseph Ward
Secretary of Natural Resources

John M.R. Bull
Commissioner

October 15, 2014

Current Property Owner
3800 Bruce Road
Chesapeake, VA 23321

Re: VMRC # 14-1388

Dear Adjacent Property Owner:

We have received an application submitted by the City of Norfolk, Department of Utilities, seeking approval from the Virginia Marine Resources Commission to install a 36-inch steel raw water main, using directional drilling technology, beneath the Western Branch of the Elizabeth River which will extend from the vicinity of 12 Sandie Point Lane in Portsmouth to the intersection of Bruce Station and Bruce Road Chesapeake.

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Sincerely,

A handwritten signature in cursive script that reads "Justine R. Woodward".

Justine R. Woodward
Environmental Engineer

JRW/jaj
HM
Enclosure
cc: Applicant
Agent

An Agency of the Natural Resources Secretariat

www.mrc.virginia.gov

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COMMONWEALTH of VIRGINIA

Marine Resources Commission

2600 Washington Avenue

Third Floor

Newport News, Virginia 23607

Molly Joseph Ward
Secretary of Natural Resources

John M.R. Bull
Commissioner

October 15, 2014

Sandie Point COA
19 Sandie Point Lane
Portsmouth, VA 23701

Re: VMRC # 14-1388

Dear Adjacent Property Owner:

We have received an application submitted by the City of Norfolk, Department of Utilities, seeking approval from the Virginia Marine Resources Commission to install a 36-inch steel raw water main, using directional drilling technology, beneath the Western Branch of the Elizabeth River which will extend from the vicinity of 12 Sandie Point Lane in Portsmouth to the intersection of Bruce Station and Bruce Road Chesapeake.

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Sincerely,

A handwritten signature in cursive script that reads "Justine R. Woodward".

Justine R. Woodward
Environmental Engineer

JRW/jaj
HM
Enclosure
cc: Applicant
Agent

An Agency of the Natural Resources Secretariat
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COMMONWEALTH of VIRGINIA

Marine Resources Commission

2600 Washington Avenue

Third Floor

Newport News, Virginia 23607

Molly Joseph Ward
Secretary of Natural Resources

John M.R. Bull
Commissioner

October 15, 2014

Harry & Mary Moore
44 Sandie Point Lane
Portsmouth, VA 23701

Re: VMRC # 14-1388

Dear Adjacent Property Owner:

We have received an application submitted by the City of Norfolk, Department of Utilities, seeking approval from the Virginia Marine Resources Commission to install a 36-inch steel raw water main, using directional drilling technology, beneath the Western Branch of the Elizabeth River which will extend from the vicinity of 12 Sandie Point Lane in Portsmouth to the intersection of Bruce Station and Bruce Road Chesapeake.

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Sincerely,

A handwritten signature in cursive script that reads "Justine R. Woodward".

Justine R. Woodward
Environmental Engineer

JRW/jaj

HM

Enclosure

cc: Applicant
Agent

An Agency of the Natural Resources Secretariat

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COMMONWEALTH of VIRGINIA

Marine Resources Commission

2600 Washington Avenue

Third Floor

Newport News, Virginia 23607

Molly Joseph Ward
Secretary of Natural Resources

John M.R. Bull
Commissioner

October 15, 2014

Joseph & Victoria Ollice
48 Sandie Point Lane
Portsmouth, VA 23701

Re: VMRC # 14-1388

Dear Adjacent Property Owner:

We have received an application submitted by the City of Norfolk, Department of Utilities, seeking approval from the Virginia Marine Resources Commission to install a 36-inch steel raw water main, using directional drilling technology, beneath the Western Branch of the Elizabeth River which will extend from the vicinity of 12 Sandie Point Lane in Portsmouth to the intersection of Bruce Station and Bruce Road Chesapeake.

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Sincerely,

A handwritten signature in cursive script that reads "Justine R. Woodward".

Justine R. Woodward
Environmental Engineer

JRW/jaj

HM

Enclosure

cc: Applicant
Agent

An Agency of the Natural Resources Secretariat

www.mrc.virginia.gov

Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD

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Reply to
Attention of

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

NOVEMBER 17, 2014

Eastern Virginia Regulatory Section
NAO-2014-0062 (Western Branch Elizabeth River)

City of Norfolk – Department of Utilities
C/o Daniel Riley
400 Granby Street
Norfolk, VA 23510

Dear Mr. Riley:

This is in regard to your Department of the Army permit application number NAO-2014-0062 (VMRC #14-1388) to temporarily impact wetlands and waters of the U.S. during the removal of approximately 750-feet of 36-inch iron pipe from the bottom of the river and the adjacent wetlands. In addition, the project includes the installation of approximately 1,900-feet of 36-inch pipe, via horizontal directional boring, for a new raw water main. Approx. 550-feet of the pipe will be beneath the Elizabeth River and will be installed a minimum of 45-feet below the natural river bottom. The new line will run from the intersection of Bruce Station and Bruce Road, Chesapeake; under the Elizabeth River; to 12 Sandie Point Lane in Portsmouth, Virginia. These impacts are detailed on the enclosed drawings entitled "Contract Drawings for Construction of 36-inch Raw Water Main Improvements – Replacement of Western Branch Elizabeth River Crossing (Line 2) Chesapeake and Portsmouth, VA" Sheets 1-14, prepared and submitted on behalf of the applicant by Michael Baker Jr., Inc. and dated May 2014 and date stamped as received by this office on September 17, 2014 (attached).

Your proposed work as outlined above satisfies the criteria contained in the Corps Nationwide Permit (12), attached. The Corps Nationwide Permits were published in the February 21, 2012 Federal Register notice (77 FR 10184) and the regulations governing their use can be found in 33 CFR 330 published in Volume 56, Number 226 of the Federal Register dated November 22, 1991.

The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

Provided the Nationwide Permit General Conditions (enclosed) are met, an individual Department of the Army Permit will not be required. In addition, the Virginia

Department of Environmental Quality has provided a conditional §401 Water Quality Certification for Nationwide Permit Number 12. Your project meets the terms of this certification; therefore no additional action is necessary. A permit may be required from the Virginia Marine Resources Commission and/or your local wetlands board, and this verification is not valid until you obtain their approval, if necessary. This authorization does not relieve your responsibility to comply with local requirements pursuant to the Chesapeake Bay Preservation Act (CBPA), nor does it supersede local government authority and responsibilities pursuant to the Act. You should contact your local government before you begin work to find out how the CBPA applies to your project.

Enclosed is a "compliance certification" form, which must be signed and returned within 30 days of completion of the project, including any required mitigation. Your signature on this form certifies that you have completed the work in accordance with the nationwide permit terms and conditions.

This verification is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked prior to March 18, 2017. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 CFR 330.4(e) and 33 CFR 330.5 (c) or (d). Project specific conditions listed in this letter continue to remain in effect after the NWP verification expires, unless the district engineer removes those conditions. Activities completed under the authorization of an NWP which was in effect at the time the activity was completed continue to be authorized by that NWP.

If you have any questions, please contact me at (757) 201-7182 or Sage.L.Joyce@usace.army.mil.

Sincerely,

A handwritten signature in cursive script that reads "Sage L. Joyce".

Sage Joyce
Project Manager/Environmental Scientist
Eastern Virginia Regulatory Section

Enclosures: NWP, Drawings, Compliance Certificate

Cc: Wetlands Board
VMRC
VA DEQ, Tidewater Office



Reply to
Attention of

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

**CERTIFICATE OF COMPLIANCE
WITH
ARMY CORPS OF ENGINEERS PERMIT**

Permit Number: NAO-2014-0062

Name of Permittee: City of Norfolk, Daniel Riley / G. Donald Gartrell

Date of Issuance: November 17, 2014

Permit Type: Nationwide Permit 12

Within 30 days of completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

Norfolk District Corps of Engineers
Regulatory Branch
ATTN: Sage Joyce
803 Front Street
Norfolk, Virginia 23510-1096

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation has been completed in accordance with the permit conditions.

Signature of Permittee

Date

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